Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of the Commission's Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference (Geneva, 2015) (WRC-15), Other Allocation Issues, and Related Rule Updates	)	ET Docket No. 23-120
	)	
Amendment of Parts 2 and 97 of the Commission's Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference (Geneva, 2015) To Allocate the Band 5351.5-5366.5 kHz to the Amateur Radio Service	)	RM-11785

REPORT AND ORDER

Adopted: September 23, 2025 **Released: December 9, 2025**

By the Commission:

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I. INTRODUCTION

1. By this Order we amend the United States Table of Frequency Allocations (U.S. Table)[1] in the Commission's rules to implement certain radiofrequency (RF) allocation decisions in the Final Acts of the International Telecommunication Union (ITU) World Radiocommunication Conference 2015 (*WRC-15 Final Acts*), make other allocation changes in the U.S. Table that are not related to *WRC-15 Final Acts* implementation, and revise parts 2, 25, 74, 78, 87, 90, 97, and 101 of the rules to reflect the allocation changes.[2]

2. In this Order, we implement certain spectrum allocation decisions from the *WRC-15 Final Acts*, which were proposed in the *WRC-15 Notice*,[3] including those for amateur radio, satellite services, and for aural broadcast auxiliary and television broadcast auxiliary stations. Our decisions are generally divided into space and terrestrial issues, along with other matters, as follows.

Satellite Issues

- Provide satellite-based search and rescue systems operating in the 406-406.1 MHz band with protection from out-of-band emissions from operations in adjacent bands by adding footnote US265[4] to the U.S. Table and revising section 90.265 to, *inter alia*, prohibit new fixed and mobile

[1] In the Commission's rules, the U.S. Table is subdivided into the Federal Table of Frequency Allocations (Federal Table, column 4 of § 2.106) and the non-Federal Table of Frequency Allocations (non-Federal Table, column 5 of § 2.106). The U.S. Table is based on the Region 2 Table of the International Telecommunication Union (ITU) International Table of Frequency Allocations (International Table) because the relevant area of jurisdiction is located primarily in Region 2 (*see* 47 CFR 2.104(b) for definitions of the ITU Regions) (*i.e.*, the 50 States, the District of Columbia, the Caribbean insular areas, and some of the Pacific insular areas). The Federal Table is administered by the National Telecommunications and Information Administration (NTIA) (*see* Section 305(a) of the Communications Act of 1934, as amended; *see also* Public Law 102-538, 106 Stat. 3533 (1992)) and the non-Federal Table is administered by the Federal Communications Commission (FCC) (*see* The Communications Act of 1934, as amended). 47 CFR § 2.105(a). The International Table and Federal Table are included in the Commission's rules for informational purposes only. 47 CFR §§ 2.104(a), 2.105(d)(3). In the United States, radio spectrum may be allocated to either Federal or non-Federal use exclusively, or for shared use. In the case of shared use, the type of service(s) permitted need not be the same (e.g., Federal FIXED, non-Federal MOBILE). The terms used to designate categories of services and allocations in columns 4 and 5 of § 2.106 correspond to the terms in the ITU Radio Regulations. Any segment of the radio spectrum may be allocated to the Federal or non-Federal sectors, or both, either on an exclusive or shared basis for use by one or more radio services. 47 CFR § 2.105(b), (c).

[2] *See* International Telecommunication Union (ITU), Final Acts WRC-15 (2016) (*WRC-15 Final Acts*), http://handle.itu.int/11.1002/pub/80d4e1c0-en.

[3] *Amendment of the Commission's Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference (Geneva, 2015) (WRC-15), Other Allocation Issues, and Related Rule Updates, Notice of Proposed Rulemaking*, ET Docket No. 23-120, 38 FCC Rcd 3528 (2023) (*WRC-15 Notice*).

[4] Under the Commission's rules, the footnotes to the Allocation Table are listed in ascending numerical order in § 2.106(b) through (e); however, in some cases, a letter(s) has/have been appended after the digit(s) of a footnote number in order to preserve the sequential order. The following symbols are used to designate footnotes in the United States Table: (i) Any footnote number in the format "5." followed by one or more digits, e.g., 5.53, denotes an international footnote. Where an international footnote is applicable, without modification, to both Federal and non-Federal operations, the Commission places the footnote in both the Federal Table and the non-Federal Table (columns 4 and 5) and the international footnote is binding on both Federal users and non-Federal licensees. If, however, an international footnote pertains to a service allocated only for Federal or non-Federal use, the international footnote will be placed only in the relevant Table. For example, footnote 5.142 pertains only to the amateur service, and thus, footnote 5.142 is shown only in the non-Federal Table. Any footnote in the format "US" followed by one or more digits, e.g., US7, denotes a stipulation affecting both Federal and non-Federal operations. United States footnotes appear in both the Federal Table and the non-Federal Table. Any footnote in the format "NG" followed by one or more digits, e.g., NG2, denotes a stipulation applicable only to non-Federal operations. Non-Federal Government (non-Federal) footnotes appear solely in the non-Federal Table (column 5). Any footnote in the format "G" followed by one or more digits, e.g., G2, denotes a stipulation applicable only to Federal

(continued….)

service frequency assignments in the adjacent 100 kilohertz bands at 405.9-406.0 MHz and 406.1-406.2 MHz. Revise footnote US13[5] and section 90.265 to prohibit new assignments for the frequencies 406.1250 and 406.1750 MHz, following the effective date of the rules in this proceeding.

- Allocate the 410-420 MHz band to the space research service (space-to-space) on a secondary basis[6] for non-Federal use, limited to communications links with an orbiting, manned space vehicle and require compliance with a power flux-density limit at the Earth's surface to protect existing and future licensees.
- Provide for Global Flight Tracking by allocating the 1087.7-1092.3 MHz sub-band to the aeronautical mobile-satellite (route) service (Earth-to-space) on a primary basis for Federal and non-Federal use, limited to space station reception of existing automatic dependent surveillance broadcast (ADS-B) emissions from aircraft and addition of paragraph (a)(13) to section 25.202 of the Commission's rules to permit the licensing of space stations that can receive ADS-B emissions from aircraft.
- Add footnote US78[7] to the 960-1164 MHz band in the Federal Table and non-Federal Table portions of the U.S. Table to recognize federal use by military systems for Identification Friend or Foe operations on center frequencies 1030 MHz (for interrogators) and 1090 MHz (for transponders).
- Revise footnote US224[8] to require federal systems that utilize spread spectrum techniques for terrestrial communication, navigation, and identification in the 960-1215 MHz band be authorized on the condition that harmful interference not be caused to aeronautical mobile, aeronautical radionavigation, military identification friend or foe operations, aeronautical mobile satellite, and radionavigation satellites.
- Defer consideration of providing spectrum on a secondary basis for non-Federal Earth-to-space operations in the Earth exploration-satellite service in the 7190-7250 MHz band and the space research service in the 7190-7235 MHz band.
- Allocate the 9.2-9.3 GHz band and the 9.9-10.4 GHz band to the Earth exploration-satellite service (active) on a primary basis for Federal use and on a secondary basis for non-Federal use.
- Revise footnote US128[9] to support the Department of Defense's development of pulsed emissions systems in the 10-10.5 GHz band for the military services.

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operations. Federal Government (Federal) footnotes appear solely in the Federal Table (column 4). 47 CFR § (d)(5)(i)-(iv). The FCC Rule parts cross referenced in column 6 of §2.106 are not allocations and are provided for informational purposes only. 47 CFR § 2.105(e).

[5] 47 CFR § 2.106(c)(13).

[6] Under the Commission's rules, stations of a secondary service shall not cause harmful interference to stations of primary services to which frequencies are already assigned or to which frequencies may be assigned at a later date; cannot claim protection from harmful interference from stations of a primary service to which frequencies are already assigned or may be assigned at a later date; and can claim protection, however, from harmful interference from stations of the same or other secondary service(s) to which frequencies may be assigned at a later date. 47 CFR § 2.105(c)(2)(i)-(iii).

[7] 47 CFR § 2.106(c)(78).

[8] 47 CFR § 2.106(c)(224).

[9] 47 CFR § 2.106(c)(128).

- Revise the rules for the 18.142-19.3 GHz, 28.5-29.1 GHz, and 29.25-29.5 GHz bands as follows. Update footnote US139[10] and the related service rules to reflect that incumbent fixed stations in the 18.3-19.3 GHz band no longer have primary status. Raise the secondary non-Federal fixed-satellite service (space-to-Earth) allocation in the 18.142-18.3 GHz band to co-primary status with the fixed service. Amend footnote US139 to allow certain fixed stations to continue to operate indefinitely under existing conditions; revise footnote NG62[11] to permit grandfathered fixed stations in the 28.5-29.1 GHz and 29.25-29.5 GHz bands to operate on a secondary basis to prioritize fixed-satellite services operating in the band.
- Delete the primary radionavigation-satellite service allocation from the 149.9-150.05 MHz and 399.9-400.05 MHz bands.

Terrestrial Issues

- Allocate the 5351.5-5366.5 kHz (60-meter) band to the amateur service on a secondary basis; continue to make available on a secondary basis the four existing channels outside of the 5351.5-5366.5 kHz band; and establish other operating guidelines for amateur use of the band.
- Update the coordination and contact information in US270 for amateur stations operating in previously defined areas of the 420-450 MHz (70 centimeter) band.
- Delete the broadcasting service allocation in the 700 MHz band.
- Delete footnote NG155 from section 2.106 as unnecessary and inapplicable under our current rules.

Other Matters

- Decline the addition of a new paragraph within section 2.102 of the Commission's rules to address certain space research service (deep space) allocations.
- Amend section 2.1(c) of the rules to add or revise definitions in accordance with those adopted at WRC-15. Revise the radiosonde definition in section 2.1(c) to correct a typographical error (i.e., correct "ballon" to read "balloon").
- Amend section 2.105(d) of the rules to clarify how the footnote references which appear in the U.S. Table are applicable to the allocated services in the U.S. Table.

II. BACKGROUND

3. The International Telecommunications Union (ITU)[12] convenes a World Radiocommunication Conference (WRC) typically every three to four years to address international spectrum use. Specifically, the WRC allocates frequency bands to various radio services generally on either a worldwide or regional basis and enters these radio services in the ITU's Table of Frequency Allocations (which is reflected in section 2.106 of our rules as the International Table of Frequency

[10] 47 CFR § 2.106(d)(62).

[11] 47 CFR § 2.106(c)(139).

[12] When we refer to the ITU in this document, we are generally referring to ITU Radiocommunication Sector (ITU-R). The work of ITU-R is organized and coordinated by the Director of the Radiocommunication Bureau (referred to as the "Bureau" in the ITU Radio Regulations, including the International Table). Under its constitution, the ITU is charged with allocating bands of the radiofrequency (RF) spectrum, allotting radio frequencies, and registering RF assignments in order to avoid harmful interference between radio stations of different countries. The ITU constitution also provides that world radiocommunication conferences "shall normally be convened every three to four years" to consider specific radiocommunication matters. *See* Constitution and Convention of the International Telecommunication Union adopted by the 2022 Plenipotentiary Conference (published in Basic Texts, 2023), http://handle.itu.int/11.1004/020.1000/5, at 5, 21, 90. *See also* the ITU Radiocommunication Sector's homepage, http://www.itu.int/en/ITU-R (last visited Jan. 7, 2025).

Allocations) as part of the Radio Regulations.[13] WRC-15 was held in Geneva, Switzerland from November 2 to November 27, 2015, with more than 40 topics addressed related to frequency allocation and sharing for spectrum and orbital resources, with the decisions ultimately published by the ITU as the *WRC-15 Final Acts*.[14] On September 10, 2018, the National Telecommunications and Information Administration (NTIA) submitted its recommendations for national implementation of the *WRC-15 Final Acts* to the Commission.[15] This was followed by the Commission's *WRC-15 Administrative Order*,[16] which reflected the WRC-15 changes to the International Table and made other non-substantive, editorial changes to the Commission's rules, including revisions to the Federal Table that did not require notice and comment.

4. The actions taken herein reflect the Notice of Proposed Rulemaking (*WRC-15 Notice*), released on April 21, 2023, in which the Commission proposed to amend the Commission's rules to implement certain of the remaining allocation decisions from the ITU's *WRC-15 Final Acts* concerning portions of the radio spectrum between 5330.5 kHz and 29.5 GHz, make other allocation changes that are not related to *WRC-15 Final Acts* implementation, and update the Commission's service rules to reflect the allocation changes.[17] As of November 28, 2023, the date that the reply comment period ended in this docket, the Commission received 3,457 filings.[18] Implementation decisions regarding WRC-15 allocations have also been made in other Commission proceedings.[19]

III. DISCUSSION

A. Satellite Issues

1. Protection of Search and Rescue Satellites Receiving in the 406-406.1 MHz Band

5. The Commission's rules currently authorize Emergency-Position Indicating Radio Beacon, Emergency Locator Transmitter, and Personal Locator Beacon transmissions in the 406-406.1 MHz band to Federal government satellites that carry Search and Rescue Satellite (SARSAT) receivers. The National Oceanic and Atmospheric Administration (NOAA) operates polar orbiting and

[13] The ITU may also include allocation use conditions, which are specified in international footnotes to its Table of Frequency Allocations. https://www.itu.int/pub/R-REG-RR-2020. The International Table of Frequency Allocations is included in the Commission's rules for informational purposes only. International footnotes are applicable in the U.S. if included in the U.S. Table. 47 CFR § 2.104(a), (h)(8).

[14] *See* Results and implications of World Radiocommunication Conference, 2015," https://www.itu.int/en/ITUR/seminars/rrs/2017-Africa/Documents/Plenary/03_%20WRC-15%20Outcomes.pdf (last visited Mar. 26, 2024); ITU Radio Regulations (Edition of 2016), Vol. 1, Article 5 (titled "Frequency allocations"), at 37, section IV (titled "Table of Frequency Allocations") at 43, https://www.itu.int/pub/R-REG-RR-2016.

[15] Letter from Peter A. Tenhula, Acting Associate Administrator, Office of Spectrum Management, NTIA, to Julius P. Knapp, Chief, FCC Office of Engineering and Technology, dated Sept. 10, 2018 (*NTIA WRC-15 Final Acts Implementation Recommendations*), https://www.fcc.gov/ecfs/document/1011648016344/1.

[16] The *WRC-15 Notice* followed an administrative order that made non-substantive, editorial revisions to the U.S. Table and to other related Commission rules. *Amendment of Parts 1, 2, 15, 27, and 95 of the Commission's Rules to Make Non-Substantive Editorial Revisions to the Table of Frequency Allocations and to Various Other Rules*, Order, 34 FCC Rcd 12830 (2020) (*WRC-15 Administrative Order*).

[17] *WRC-15 Notice*, 38 FCC Rcd 3528.

[18] FCC, ECFS Search Results, https://www.fcc.gov/ecfs/search/search-filings/results?q=(date_received:[2023-09-28%20TO%202023-11-28]+AND+proceedings.name:(%2223-120%22)) (last visited June 9, 2025).

[19] *See WRC-15 Notice*, 38 FCC Rcd at 3532, n.17.

geostationary satellites that carry payloads providing distress alert and location information to appropriate public safety rescue authorities for maritime, aviation, and land users in distress.[20]

6. We adopt proposals addressing concerns that aggregate levels of electromagnetic interference, including interference from transmissions in adjacent frequency bands, are adversely affecting the operations of SARSAT receivers operating in the 406-406.1 MHz band.[21] These proposals received no comment. First, we adopt the Commission's proposal[22] for a new footnote US265[23] in the U.S. Table (Federal and non-Federal portions) in section 2.106(a) for the 403-410 MHz band to prohibit new frequency assignments within the 405.9-406.0 MHz and 406.1-406.2 MHz bands under the fixed and mobile services allocations in the 403-406 MHz and 406.1-410 MHz bands.[24] We adopt our tentative conclusion that medical device radiocommunication service (MedRadio)[25] operations currently allowed by footnote US64 will not interfere with SARSAT operations due to their ultra-low power generation. No commenter disagreed with this tentative conclusion. Accordingly, we conclude that MedRadio devices can operate consistent with US265 and their secondary status within the band[26] and we do not believe that US265's prohibition of new frequency assignments within the 405.9-406.0 MHz and 406.1-406.2 MHz bands requires us to restrict MedRadio's continued use and growth within the 401-406 MHz band. The Commission also adopts its proposal which states that, in order to protect SARSAT devices, any radiosonde[27] applicants seeking to operate in the band would need to take into account frequency drift characteristics when selecting operating frequencies above 405 MHz to avoid transmitting in the 406-406.1 MHz band and to take all practical steps to avoid the operating frequency drifting close to 406 MHz.

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[20] 47 CFR §§ 80.209(a)(7), 80.905(a)(3)(vi), (a)(4)(vi), 80.1077, 80.1129(c), 87.139(h), 87.147(e), 87.173(b), 87.187(m), 87.195(a), 87.199, 95.2963, and 95.2971. *NTIA WRC-15 Final Acts Implementation Recommendations*, Attachment 1 – Annex 9.1.1, 83-86, https://www.fcc.gov/ecfs/document/1011648016344/1.

[21] In Resolution 205, WRC-15 (and later WRC-19) resolved to "to request administrations not to make new frequency assignments within the frequency bands 405.9-406.0 MHz and 406.1-406.2 MHz under the mobile and fixed services." *See WRC-15 Final Acts*, Resolutions, at 272, https://www.itu.int/dms_pub/itu-r/opb/act/R-ACT-WRC.12-2015-PDF-E.pdf; World Radiocommunication Conference 2019 (WRC-19) Final Acts (*WRC-19 Final Acts*), Resolutions, at 326, https://www.itu.int/dms_pub/itu-r/opb/act/R-ACT-WRC.14-2019-PDF-E.pdf.

[22] *WRC-15 Notice*, 38 FCC Rcd at 3538-39, para. 18.

[23] Added to the Commission's rules in section 2.106 as para. (c)(265).

[24] Non-Federal use of the fixed and mobile services in the adjacent 403-406 MHz and 406.1-410 MHz bands is permitted pursuant to footnotes US13 (47 CFR § 2.106(c)(13)), US55 (47 CFR § 2.106(c)(55)), and US64 (47 CFR § 2.106(c)(64)).

[25] US64 states that the 403-406 MHz band is allocated to the mobile except aeronautical mobile service on a secondary basis and that non-Federal use is limited to (MedRadio) operations. 47 CFR § 2.106(c)(64). MedRadio devices operate in the 401-406 MHz band on a licensed-by-rule-basis. 47 CFR § 95.2563. "Licensed-by-rule" means that an authorized user can access the entire available spectrum without an individual station license document and is instead authorized to operate as long as the operations are in accordance with the applicable service rules. *See* 47 U.S.C. § 307(e). Thus, while all spectrum use is shared among users who meet the eligibility and technical qualifications and no one has exclusive rights to any portion of the spectrum, those users are collectively afforded interference protection vis-à-vis other services, based on the allocation status under which they operate.

[26] *See* 47 CFR §§ 95.2505 (MedRadio is defined as an ultra-low power radio service associated with medical implant devices), 95.2567 (radiated power limited to a maximum of 25 microwatts M-EIRP, 95.2503 [MedRadio equivalent isotropically radiated power]).

[27] The 403-406 MHz band is a Federal/non-Federal shared band that is also allocated to the meteorological aids service (radiosondes) on a primary basis. A radiosonde is an automatic radio transmitter in the meteorological aids service usually carried on an aircraft, free balloon, kite, or parachute, and which transmits meteorological data. 47 CFR § 2.1 Terms and Definitions. The Commission licenses radiosondes under its part 5 experimental radio service; however, there are currently no active licenses for non-Federal radiosonde use of the 403-406 MHz band. 47 CFR part 5.

7. We also adopt related proposals regarding fixed and mobile services in the adjacent 403-406 MHz and 406.1-410 MHz bands. These proposals also received no comment. First, in the *WRC-15 Notice*, the Commission proposed to revise footnote US13 and section 90.265[28] to state that, after the effective date of the final rules in this proceeding, no assignments for the frequencies 406.1250 MHz and 406.1750 MHz would be made, and that existing stations could continue to operate indefinitely on these frequencies as they are currently licensed.[29] We received no comment on this proposal and therefore revise footnote US13 and section 90.265 as proposed. We believe that this action will ensure consistency with US265 and help protect SARSAT systems operating in the adjacent 406-406.1 MHz band from out-of-band emissions (OOBE) originating on the frequencies 406.1250 MHz and 406.1750 MHz. We also adopt the Commission's proposal[30] to update footnote US117[31] to reflect that non-federal use of the 406.1-410 MHz band is limited to the radio astronomy service and as provided by footnotes US13[32] and US55.[33]

2. Space Research Service (space-to-space) in the 410-420 MHz Band

8. Current use of the 410-420 MHz band is limited to the fixed, mobile, and space research (space-to-space) services on a primary basis for Federal use, with non-Federal use limited to MedRadio operations in the 413-419 MHz segment of the band.[34] As proposed in the *WRC-15 Notice*,[35] we allocate the 410-420 MHz band to the space research service (space-to-space) on a secondary basis for non-Federal use. We also adopt footnote 5.268[36] in the non-Federal portion of the U.S. Table in the 410-420 MHz band. Footnote 5.268 limits the use of the space research service to space-to-space communication links with an orbiting, manned space vehicle, and requires compliance with a power flux density (PFD) limit at the Earth's surface of -153 to -148 dBw/m² in a 4-kilohertz bandwidth, depending

[28] Footnote US13 and section 90.265 of the Commission's rules make 48 channels available for transmitting hydrological and meteorological data (Hydro channels), including channels with center frequencies 406.125 MHz and 406.175. 47 CFR §§ 2.106(a), (c)(13), 90.265(a), (a)(8).

[29] *WRC-15 Notice*, 38 FCC Rcd at 3539, para. 20. As of March 27, 2024, 98 licenses in the Commission's Universal Licensing System authorized operation in the 406.125-406.175 MHz band. This Order does not modify those licenses.

[30] *WRC-15 Notice*, 38 FCC Rcd at 3539-40, para. 21.

[31] 47 CFR § 2.106(c)(117).

[32] 47 CFR § 2.106(c)(13). Under section 2.106(c)(13), [t]he center frequencies in table 2 to paragraph (c)(13)(i) of this section, each with a channel bandwidth not greater than 12.5 kHz, are available for assignment to non-Federal fixed stations for the specific purpose of transmitting hydrological and meteorological data in cooperation with Federal agencies, subject to the condition that harmful interference will not be caused to Federal stations. New assignments on the frequencies 406.125 MHz and 406.175 MHz are to be primarily for paired operations with the frequencies 415.125 MHz and 415.175 MHz, respectively.

[33] 47 CFR § 2.106(c)(55). Under section 2.160(c)(55), [i]n the bands 162.0375-173.2 MHz and 406.1-420 MHz, the FCC may authorize public safety applicants to use the 40 Federal Interoperability Channels that are designated for joint Federal/non-Federal operations for law enforcement, public safety, emergency response and disaster response in Section 4.3.16 of the NTIA Manual, subject to the condition that that these non-Federal mobile (including portable) interoperability communications shall conform to the national plans specified therein, and in particular, shall not cause harmful interference to Federal stations. The procedure for authorizing such use is set forth in § 90.25 of this chapter.

[34] 47 CFR § 2.106(a), (c)(64)(i)(ii), part 95, subpart I, §§ 95.2501-96.2699, Medical Radio Device Communication Service. The National Aeronautics and Space Administration (NASA) operates systems in support of extra-vehicular activity communications for the manned space program and other space-related efforts in this band. The systems are used for communications between crew members and for relaying telemetry data to the main spacecraft.

[35] *WRC-15 Notice*, 38 FCC Rcd at 3540, para. 22.

[36] 47 CFR § 2.106(b)(268).

on the angle of arrival of the radio-frequency wave, to protect existing and future fixed and mobile services operations from harmful interference.[37]

9. These proposals received no comment and we conclude that allocating the 410-420 MHz band to the space research service (space-to-space) on a secondary basis for non-Federal use will support both increased commercial exploration of the deep space environment and protect primary Federal operations in this band. Additionally, the adoption of footnote 5.268 restricts the use of this band to communications links with an orbiting, manned space vehicle and limits the PFD at Earth's surface, which will protect stations of the primary fixed and mobile services bands from harmful interference.

3. Global Flight Tracking for Civil Aviation (1087.7-1092.3 MHz)

10. We adopt proposals intended to enhance global flight tracking capabilities. First we adopt the Commission's proposal to allocate the 1087.7-1092.3 MHz band to the aeronautical mobile-satellite (route) service (Earth-to-space) on a primary basis for Federal and non-Federal use, limited to space station reception of automatic dependent surveillance-broadcast (ADS-B) emissions from aircraft by referencing footnote 5.328AA[38] in the 960-1164 MHz band within the U.S. Table.[39] ADS-B is a service that automatically broadcasts GPS-derived data on the location, velocity, altitude, heading, and other performance metrics, of an ADS-B-equipped aircraft to other ADS-B-equipped aircraft and ground stations for distribution to air traffic control systems.[40] Pursuant to Federal Aviation Administration regulations, after January 1, 2020, virtually all aircraft must be able to transmit ADS-B information (ADS-B Out) to fly in most controlled airspace.[41] For aircraft that operate above 18,000 feet or need to comply with ADS-B requirements outside the United States, the equipment must operate on the frequency 1090 MHz using what are often referred to as 1090ES transponders. All other aircraft may carry equipment operating either on frequency 978 MHz or frequency 1090 MHz.[42] In 2006, the Commission adopted technical and operational rules for ADS-B transmissions on 978 MHz using Universal Access Transceiver (UAT) technology.[43] While the Commission authorized the use of the frequency 1090 MHz

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[37] 47 CFR § 2.106(a), (b)(268).

[38] 47 CFR § 2.106(b)(328(ii).

[39] *WRC-15 Notice*, 38 FCC Rcd at 3540-41, para. 23. Footnote 5.328AA states that: The frequency band 1087.7-1092.3 MHz is also allocated to the aeronautical mobile-satellite (R) service (Earth-to-space) on a primary basis, limited to the space station reception of Automatic Dependent Surveillance-Broadcast (ADS-B) emissions from aircraft transmitters that operate in accordance with recognized international aeronautical standards. Stations operating in the aeronautical mobile-satellite (R) service shall not claim protection from stations operating in the aeronautical radionavigation service. Resolution 425 (Rev.WRC-19) shall apply. 47 CFR § 2.106(b)(328)(ii). *See also NTIA WRC-15 Final Acts Implementation Recommendations*, Attachment 1 – Annex GFT/IFF, at 104, and Attachment 2 – US128, at 106, https://www.fcc.gov/ecfs/document/1011648016344/1; and ITU Radio Regulations, Resolution 425 (WRC-15), at 281-282.

[40] *See Review of Part 87 of the Commission's Rules Concerning the Aviation Radio Service*, Second Report and Order and Second Further Notice of Proposed Rule Making, 21 FCC Rcd 11582, 11587, n.18 (2006) (*2006 Part 87 Report and Order*); 47 CFR § 87.5.

[41] *See* 14 CFR §§ 91.225, 91.227; Federal Aviation Administration, Advisory Circular: Automatic Dependent Surveillance-Broadcast Operations, FAA AC 90-114A with Change 1, at para. 2-2.c (2014) (AC 90-114A), available at https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_90-114A_CHG_1.pdf. There is a partial exemption from the ADS-B carriage requirements for "any aircraft that was not originally certificated with an electrical system, or that has not subsequently been certified with such a system installed, including balloons and gliders." 14 CFR § 91.225(e). The transmission of ADS-B information from aircraft is known as "ADS-B Out" and the reception of ADS-B information by aircraft is known as "ADS-B In."

[42] *See* 14 CFR §§ 91.225, 91.227; AC 90-114A at para. 2-2.c.

[43] *See 2006 Part 87 Report and Order*, 21 FCC Rcd at 11587-88, para. 8. A Universal Access Transceiver (UAT) is defined in part 87 as a "radio datalink system authorized to operate on the frequency 978 MHz to support Automatic (continued….)

by aeronautical utility mobile stations used for airport surface detection in 2013,[44] it has not adopted technical and operational rules specifically for airborne ADS-B transmissions on 1090 MHz. However, part 87 accommodates the use of 1090 MHz aeronautical utility mobile stations as airborne electronic aids to navigation in the 960-1215 MHz band.[45]

11. We adopt the proposed implementation of the primary aeronautical mobile-satellite (route) service allocation, limited to space station reception of automatic dependent surveillance-broadcast (ADS-B) emissions from aircraft, by referencing footnote 5.328AA[46] in the 960-1164 MHz band within the U.S. Table (Federal and non-Federal Tables).[47] Under section 87.5 in the Commission's aviation service rules, ADS-B is currently defined as broadcast transmissions from aircraft, supporting aircraft-to-aircraft or aircraft-to-ground surveillance applications, including position reports, velocity vector, intent and other relevant information about the aircraft.[48] To reflect this enhanced ADS-B capability in the aviation service rules, we modify the definition of ADS-B in section 87.5 to include space station reception of automatic dependent surveillance-broadcast (ADS-B) emissions from aircraft in the 1087.7-1092.3 MHz band. Additionally, we add paragraph (a)(13) to section 25.202 of the Commission's rules to permit the licensing of space stations that can receive ADS-B emissions in the 1087.7-1092.3 MHz band from aircraft. The new primary aeronautical mobile-satellite (route) service (Earth-to-space) allocation that we add in section 2.106(a) will extend reception of ADS-B signals beyond terrestrial line-of-sight to facilitate reporting the position of aircraft located anywhere in the world. As aircraft travel over land, there are generally terrestrial networks capable of forwarding this information to flight control centers. When travelling over an ocean or other remote regions, however, space stations can provide an alternative ADS-B point of reception.

12. Iridium, in its comments, supports the Commission's proposal to create a primary allocation in the band for Earth-to-space ADS-B transmissions from aircraft.[49] Further, Iridium suggests that the Commission should automatically upgrade to primary status existing Earth-to-space authorizations in the band, such as those in its second-generation satellite authorization.[50] No commenter opposed this proposal.

13. We agree with Iridium and conclude that providing a primary allocation for satellite reception of ADS-B signals from aircraft-in-flight would ensure the efficient management of air traffic in oceanic, polar, and remote airspace. The use of ADS-B directly influences many factors, such as the minimum separation distances between aircraft, resulting in the efficient use of airspace, optimization of air routes, and altitude availability due to events such as changes in weather conditions. Regarding Iridium's request that existing Earth-to-space operations in this band, such as those in Iridium's second-generation satellite authorization, automatically be upgraded to primary status, the Commission directs

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Dependent Surveillance—Broadcast (ADS–B) Service, Traffic Information Services—Broadcast (TIS–B) and Flight Information Service—Broadcast (FIS–B)." *See* 47 CFR §§ 87.5, 87.173, 87.349(e).

[44] *See Amendment of the Commission's Rules Governing Certain Aviation Ground Station Equipment*, et al., Report and Order, 28 FCC Rcd 2693, para. 1 (2013) (*Ground Station Report and Order*); 47 CFR §§ 87.173, 87.349(f).

[45] *See* 47 CFR § 87.187(n).

[46] 47 CFR § 2.106(b)(328)(ii).

[47] 47 CFR § 2.106(a).

[48] 47 CFR § 87.5.

[49] In this regard, Iridium cites as an example the loss of Malaysia Airlines flight 370 in 2014, suggesting that disappearance may have been quickly resolved through the use of ADS-B transmitters, in conjunction with receive equipment on space stations. Iridium NPRM Comments at 3.

[50] *Id*. *See also* Iridium Constellation LLC Application for Modification of License to Authorize a Second-Generation NGSO MSS Constellation, Order and Authorization, 31 FCC Rcd 8675 (IB and OET, 2016), at 8684-85, 8690-91, paras. 24-27, 45.

Iridium to the terms of its waiver grant.[51] Specifically, the Commission stated as a condition of licensing Iridium's second-generation satellites that "[o]perations in the 156.0125- 162.0375 MHz and 1087.7-1092.3 MHz bands must be in accordance with any Commission rulemakings subsequent to the release of this Order and Authorization that implement any new domestic allocations or service rules for these bands."[52] As our rule today allocates the 1087.7-1092.3 MHz band to the aeronautical mobile-satellite (route) service (Earth-to-space) on a primary basis for Federal and non-Federal use, Iridium's existing ADS-B satellite operations in this band would, under the terms of the waiver, also attain primary status within this band.

14. As proposed,[53] we also add new footnote US78[54] to the 960-1164 MHz band in the U.S. Table in section 2.106(a) to recognize Federal use by military systems for Identification Friend or Foe (IFF) operations on center frequencies 1030 MHz (for interrogators) and 1090 MHz (for transponders).[55] This proposal, suggested by NTIA,[56] did not result in any comments. This use will be subject to the condition that harmful interference not be caused to the aeronautical radionavigation service or the aeronautical mobile (R) service.[57] We believe that this use will enhance the ability of military aircraft to determine whether other aircraft are friendly in nature.

15. Lastly, as proposed, we revise footnote US224[58] to require Federal systems that utilize spectrum spread techniques for terrestrial communication, navigation, and identification in the 960-1215 MHz band be authorized on the condition that harmful interference not be caused to the aeronautical mobile (route) and aeronautical radionavigation services in the 960-1164 MHz band, Federal IFF systems on center frequencies 1030/1090 MHz, aeronautical mobile-satellite (route) service (Earth-to-space) in the 1087.7-1092.3 MHz band, and the aeronautical radionavigation and radionavigation-satellite (space-to-Earth) (space-to-space) services in the 1164-1215 MHz band.[59] We believe that this footnote revision is necessary to protect the increased number of services operating in the aforementioned bands. Although

[51] *Iridium Waiver Grant*, 31 FCC Rcd at 8689, para. 50.

[52] *Id*.

[53] *See WRC-15 Notice*, 38 FCC Rcd at 3541, para. 24.

[54] Added to the Commission's rules in section 2.106 as para. (c)(78).

[55] Identification Friend or Foe Interrogators are electronic devices that emit an "interrogating" radio signal at one frequency, prompting an IFF Transponder to emit a reply signal at a different frequency, indicating that an approach aircraft is "friendly." *See* https://www.baesystems.com/en-us/definition/what-are-iff-technologies.

[56] *NTIA WRC-15 Final Acts Implementation Recommendations*, Attachment 1, Annex GFT/IFF, at 104-105, https://www.fcc.gov/ecfs/document/1011648016344/1.

[57] Specifically, NTIA recommends a footnote (which the Commission proposed as US78) stating that military systems used for Identification Friend or Foe (IFF) operations are authorized to operate on the center frequencies 1030 MHz for interrogators and 1090 MHz for transponders on the condition that harmful interference would not be caused to the aeronautical radionavigation service or the aeronautical mobile (route) service. These IFF systems would be evaluated on a case-by-case basis using mutually agreed upon Federal methodologies, technical criteria, and characteristics for calculating potential interference between the civil aviation systems and systems used for military or other national defense IFF operations, including mutually agreed upon Federal methodologies and criteria for considering the aggregation of civil and military systems in the 1030 and 1090 MHz bands in the evaluation. *Id*. at 105.

[58] 47 CFR § 2.106(c)(224).

[59] Under the Commission's rules, US224 currently states that Federal systems utilizing spread spectrum techniques for terrestrial communication, navigation and identification may be authorized to operate in the band 960-1215 MHz on the condition that harmful interference will not be caused to the aeronautical radionavigation service. These systems will be handled on a case-by-case basis. Such systems shall be subject to a review at the national level for operational requirements and electromagnetic compatibility prior to development, procurement or modification. 47 CFR § 2.106(c)(224).

updates to our part 87 rules were not specifically proposed in the *WRC-15 Notice*'s rule parts list,[60] the Commission did request comment on whether modifications to our part 87 rules were necessary to implement any of the proposed changes.[61] We received no comment but conclude that, in order to fully implement our decision, we must revise section 87.479 of the Commission's rules to reflect the additional aviation services that will now be entitled to protection that footnote US224 provides to part 87 radionavigation services in the 960-1215 MHz band.[62]

4. Satellite Uplinks in the 7190-7250 MHz Band

16. In the *WRC-15 Notice*, as recommended by NTIA, the Commission sought comment on whether it should provide spectrum on a secondary basis for non-Federal Earth-to-space operations for the Earth exploration-satellite service in the 7190-7250 MHz band and the space research service in the 7190-7235 MHz band.[63] In the U.S. Table, the 7190-7235 MHz band is allocated to the Earth exploration-satellite (Earth-to-space) and fixed services, both on a primary basis and exclusively for Federal use.[64] The 7190-7235 MHz portion of the band is also allocated on a primary basis to the space research services (Earth-to-space) exclusively for Federal use.[65] For the reasons discussed below, we decline to address these spectrum bands herein and are deferring a decision for future Commission action.

17. The Commission specifically sought comment on making these Federal uplink bands available for non-Federal use on a secondary basis for Earth-to-space operations in the Earth exploration-satellite and space research services by adding footnotes US460 and US460A to the 7190-7235 MHz band and footnote US460A to the 7235-7250 MHz band. Footnote US460 would provide a secondary non-Federal allocation in the 7190-7235 MHz band for the space research service (Earth-to-space) and would prohibit emissions from such systems intended for deep space. Footnote US460A would allocate the 7190-7250 MHz band to the Earth exploration-satellite service (Earth-to-space) on a secondary basis for non-Federal use, limited to tracking, telemetry, and command (TT&C) for the operation of spacecraft.[66] Commenters express concern with these proposals. NCTA, in its comments, states that "[t]he circumstances of the 7/8 GHz range have changed significantly since the Commission issued the NPRM in April 2023 and even more since NTIA made its original recommendation to the Commission in 2018. Qualcomm states that moving now to allocate these sub-bands "would further complicate the spectral landscape that has been earmarked for domestic study and potentially international studies under the ITU-R working groups."[67]

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[60] *WRC-15 Notice*, 38 FCC Rcd at 3538, para. 17.

[61] *Id*., 38 FCC Rcd at 3541, para. 24.

[62] *See* 47 CFR § 87.479 ("Harmful interference to radionavigation land stations").

[63] *WRC-15 Notice*, 38 FCC Rcd at 3541-42, paras.25-26.

[64] 47 CFR § 2.106(a). As requested by NTIA, in the *WRC-15 Administrative Order*, the Commission added a primary Federal allocation to the Federal Table portion of the U.S. Table for the Earth exploration-satellite service(EESS) (Earth-to-space) in the 7190-7250 MHz band and two international footnotes (5.460A, 5.460B) that limit the use of this EESS uplink allocation. Footnote 5.460A limits the EESS uplink allocation to tracking, telemetry, and command for the operation of spacecraft, and, e.g., specifies that space stations operating under this allocation in the 7190-7250 MHz band may not claim protection from stations in the fixed and mobile services. 47 CFR § 2.106(b)(460)(i). Footnote 5.460B states that EESS geostationary satellites receiving in the 7190-7235 MHz band may not claim protection from existing and future stations of the space research service. 47 CFR § 2.106(b)(460)(ii). The Commission also replaced footnote G133 (47 CFR §2.106(e)(133)) with the essentially identical international footnote 5.460. *WRC-15 Administrative Order*, supra note 3, para. 10. Under footnotes 5.458 (passive measurements), 5.460A, 5.460B, and G134, up to five earth stations in the meteorological-satellite service (Earth-to-space) may be authorized. 47 CFR § 2.106(b)(458), (460)(i), (ii), (e)(134).

[65] 47 CFR § 2.106(a).

[66] The restrictions in footnotes US460 and US460A are based on footnotes 5.460 and 5.460A.

[67] Qualcomm NPRM Comments at 2.

18. Multiple commenters cite the National Spectrum Strategy (NSS) to assert that additional allocations in the 7/8 GHz band could complicate future allocation decisions.[68] One of the spectrum bands identified is the 7125-8400 MHz band, which the NSS states "will be studied for wireless broadband use" (on a licensed and/or unlicensed basis), though, as NTIA states in the strategy, "some sub-bands eventually may be studied for other uses."[69] It goes on to state that there are a variety of mission-critical Federal operations in this band (including Fixed, Fixed Satellite, Mobile, Mobile-Satellite, Space Research, Earth Exploration-Satellite, and Meteorological-Satellite Services) that would make it challenging to repurpose portions of the band while protecting incumbents from harmful interference.[70]

19. CTIA states that any proposal to allocate the "7190-7235 MHz band to the Space Research Service and the 7190-7235 MHz band to the Earth Exploration Satellite-Service on a secondary basis for non-Federal use has been overcome by the NSS and a series of additional events since WRC-15's conclusion and NTIA's submission to the Commission of its *WRC-15 Final Acts* implementation recommendations."[71] CTIA goes on to state that the 7/8 GHz spectrum range is vital "to the 7-16 GHz band that Chairwoman Rosenworcel has identified for 6G and that the ITU is expected to explore this spectrum range for next-generation wireless deployments."[72] T-Mobile states that the Commission should refrain from taking any action that would "limit its options regarding the use of these bands for future wireless services."[73]

20. Lockheed Martin, however, states in its comments that "implementing only a secondary non-Federal allocation domestically [in support of deep-space operations] poses the risk of rendering the band unusable for future non-Federal operations absent adequate protections."[74] Lockheed encourages the Commission to instead make the allocation on a primary basis in the Table of Allocations.[75]

21. In light of ongoing governmental workstreams reviewing the band, changes in the spectral environment, and opposition from stakeholders across multiple sectors, we find it premature to reach a decision at this time on additional allocations in this band. The Senate Commerce Committee's budget reconciliation bill proposes that the NTIA conduct a timely spectrum analysis of the 7.25-7.4 GHz band[76] in support of the House's budget reconciliation bill which outlines the Administration's effort to identify and auction 600 megahertz of spectrum for advanced mobile and fixed broadband services.[77] Lawmakers have identified the 7/8 GHz band in particular as warranting consideration for future

[68] *See* CTIA NPRM Comments at 3; Verizon NPRM Reply Comments at 5; T-Mobile NPRM Comments at 4.

[69] *Id*.

[70] *Id*.

[71] CTIA NPRM Comments at 2-3.

[72] *See* CTIA NPRM Comments at 3; Chairwoman Rosenworcel Remarks to National Science Foundation '6G: Open and Resilient By Design', https://www.benton.org/headlines/chairwoman-rosenworcel-remarks-national-science-foundation-6g-open-and-resilient-design (last accessed Jan. 8, 2025).

[73] T-Mobile USA NPRM Comments at 4.

[74] Lockheed Martin NPRM Comments at 2-3.

[75] *Id.* at 3; Lockheed also notes that operations conducted under such a primary allocation would be subject to satisfactory coordination with all relevant federal agencies through the NTIA's frequency coordination process.

[76] Committee on Commerce, Science, and Transportation, Sec. 0002(f)(C), (pg. 11) https://www.commerce.senate.gov/services/files/AD3D04CF-52B4-411F-854B-44C55ABBADDA.

[77] H.R.1 - One Big Beautiful Bill Act, 119th Congress (2025-2026), Subtitle C, Part 1 – Spectrum Auctions, Sec. 43101, Identification and Auction of Spectrum, https://www.congress.gov/bill/119th-congress/house-bill/1/text.

spectrum auctions.[78] While the Commission recognizes the importance of the space exploration mission being undertaken by NASA and its commercial partners, the information received in the record indicates that moving ahead with allocations in these bands at this time could complicate studies of the bands for advanced wireless uses.

5. Earth Exploration-Satellite Service (Active) in the 9.2-9.3 GHz and 9.9-10.4 GHz Bands

22. We adopt the Commission's proposals to allocate the 9.2-9.3 GHz and 9.9-10.4 GHz bands to the Earth exploration-satellite service (active) on a primary basis for Federal use and on a secondary basis for non-Federal use, subject to four footnotes: 5.474A, 5.474B, 5.474C, and US474D.[79] These proposals would implement WRC-15's expansion of the current worldwide Earth exploration-satellite service (active) allocation in the 9.3-9.9 GHz band by allocating an additional 600 megahertz of spectrum in the adjacent bands to this service and support the growing demand for greater image resolution to satisfy global environmental monitoring requirements while protecting adjacent-bands services from any interference issues this increase in usage may cause.[80] Spaceborne radars operating in this band support a large number of scientific and geoinformation applications, such as disaster relief and humanitarian aid, land use, and large area coastal surveillance.[81]

23. In the *WRC-15 Notice*, the Commission sought comment on whether to allocate the 9.2-9.3 GHz and 9.9-10.4 GHz bands to the Earth exploration-satellite service (active) on a primary basis for Federal use and on a secondary basis for non-Federal use, subject to the conditions of four footnotes added to the 9.2-9.3 GHz and 9.9-10.4 GHz bands (5.474A, 5.474B, 5.474C, and US474D).[82] Footnote 5.474A[83] limits the use of the 9.2-9.3 GHz and 9.9-10.4 GHz bands to systems in the Earth exploration satellite service (active) requiring a necessary bandwidth greater than 600 megahertz that cannot be fully accommodated within the 9.3-9.9 GHz band.[84] Footnote 5.474B[85] states that stations in the Earth

[78] "The twofold path forward must be (1) an aggressive pursuit of spectrum sharing technology for use throughout the spectrum (not just the critical lower-3 band), and (2) a thorough and candid assessment of what portion, if any, of the 7 and 8 GHz band of spectrum can be auctioned off to industry without harming national security." Sen. Mike Rounds, *Protection of spectrum by Congress also protects Trump's Iron Dome from shortsighted 5G policy* (Feb. 26, 2025), https://defensescoop.com/2025/02/26/spectrum-5g-policy-congress-trump-dod-iron-dome-senator-mike-rounds/.

[79] *WRC-15 Notice*, 38 FCC Rcd at 3542-43, para. 27. Footnote US474D is based on the text in international footnote 5.474D (47 CFR § 2.106(b)(474)(iv)), except that the Commission did not include the radiolocation service in the 9.2-9.3 GHz band because this allocation has secondary status in both the Federal and non-Federal Tables, and we did not include the radionavigation service in the 9.9-10 GHz band because that allocation only applies in the countries listed in footnote 5.478 (47 CFR § 2.106(b)(478)). Appx. A (US474D); 47 CFR § 2.106(b)(474)(i), (ii), (iii), (iv) (footnotes 5.474A, 5.474B, 5.474C, 5.474D); and *NTIA WRC-15 Final Acts Implementation Recommendations*, Attachment 1 – Annex 1.12, at 61-63, https://www.fcc.gov/ecfs/document/1011648016344/1.

[80] In the U.S. Table, the 9.2-9.3 GHz band is allocated to the maritime radionavigation service on a primary basis and to the radiolocation service on a secondary basis for Federal and non-Federal use. The 9.9-10.5 GHz band is allocated to the radiolocation service on a primary basis for Federal use and on a secondary basis for non-Federal use. 47 CFR § 2.106(a).

[81] In its proposals for WRC-15, the Inter-American Telecommunication Commission (CITEL) stated that "For such applications, there is a growing demand for increasing radar image resolution. Therefore, it is necessary to increase the bandwidth by another 600 MHz for a total of 1200 MHz contiguous bandwidth." CITEL Proposals to WRC-15, agenda item 1.12, Addendum 12 to Document 7-E, dated August 21, 2015 (Doc4000-1_12.doc) and CPM Report to WRC-15, agenda item 11.2, Chapter 2, p. 21-22, Background.

[82] *WRC-15 Notice*, 38 FCC Rcd at 3542-43, paras. 27-29.

[83] 47 CFR § 2.106(c)(224).

[84] *WRC-15 Notice*, 38 FCC Rcd at 3543, para. 29.

[85] 47 CFR § 2.106(b)(474)(ii).

exploration-satellite service (active) shall comply with Recommendation ITU-R RS.2066-0 (WRC-15), which provides an operational procedure to avoid main-beam to main-beam coupling between Earth exploration-satellite service systems when transmitting near 9.6 GHz and radio astronomy service stations performing observations in the 10.6-10.7 GHz band.[86] Footnote 5.474C[87] states that stations operating in the Earth exploration-satellite (active) service shall comply with Recommendation ITU-R RS.2065-0 (WRC-15), which provides mitigation techniques that can reduce the unwanted emissions of Earth exploration-satellite service (active) systems to avoid interference with space research service (space-to-Earth) links in the 8.40-8.45 GHz and 8.45-8.50 GHz bands.[88] Lastly, footnote US474D (based partially on footnote 5.474D[89]) would require that stations in the Earth exploration-satellite service (active) not cause harmful interference to, or claim protection from, the maritime radionavigation service in the 9.2-9.3 GHz band and the radiolocation service in the 9.9-10.4 GHz band. The Commission also sought comment on whether the 9.2-9.8 GHz and 9.9-10.4 GHz bands should be allocated to the Earth exploration satellite-service (active) on a primary basis for non-Federal use, so that the status of those non-Federal allocations would mirror the status of the Federal Earth exploration satellite-services (active) in those bands.[90] We received no comment on these proposals.

24. We adopt the proposal to allocate the 9.2-9.3 GHz and 9.9-10.4 GHz bands to the Earth exploration satellite-service (active) on a primary basis for Federal use and on a secondary basis for non-Federal use, subject to the four aforementioned footnotes (5.474A, 5.474B, 5.474C, US474D). We believe that this allocation will support the growing demand for scientific and geoinformation applications for both the Federal and non-Federal operations. Further, the application of the four footnotes to these bands will protect adjacent services from any interference issues this increase in usage may cause. Lastly, we decline to adopt our proposal to allocate the 9.2-9.8 GHz and the 9.9-10.4 GHz bands to the Earth exploration satellite-service (active) on a primary basis for non-Federal use so the status of these allocations would mirror the status of the primary Federal Earth exploration satellite-service (active) allocations in these bands, as we believe that the non-Federal secondary allocation we adopt today in the 9.2-9.3 GHz and 9.9-10.4 GHz bands will provide non-Federal users with sufficient bandwidth for their operations. Declining to raise the status of the secondary non-Federal Earth exploration satellite-service (active) allocations in these bands to primary status will also help protect adjacent-band operations from harmful interference, as the proposed non-Federal primary allocation was not subject to footnotes 5.474A, 5.474B, 5.474C, and US474D, which the *WRC-15 Final Acts* prescribed to protect adjacent services from increased EESS usage in the 9.2-9.3 GHz and 9.9-10.4 GHz bands.

25. The Commission also proposed to revise footnote US128[91] to support the Department of Defense's (DOD) development of pulsed emissions systems for the military services in the 10-10.5 GHz band.[92] The 10-10.5 GHz band is currently allocated to the radiolocation service on a primary basis for

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[86] *See* Protection of the radio astronomy service in the frequency band 10.6-10.7 GHz from unwanted emissions of synthetic aperture radars operating in the Earth exploration-satellite service (active) around 9 600 MHz https://www.itu.int/rec/R-REC-RS.2066/en (last visited Jan. 8, 2025).

[87] 47 CFR § 2.106(b)(474)(iii).

[88] *See* Protection of space research service space-to-Earth links in the 8 400-8 450 MHz and 8 450-8 500 MHz bands from unwanted emissions of synthetic aperture radars operating in the Earth exploration-satellite service (active) around 9 600 MHz https://www.itu.int/dms_pubrec/itu-r/rec/rs/R-REC-RS.2065-0-201412-I!!PDF-E.pdf (last visited Jan. 8, 2025).

[89] 47 CFR § 2.106(b)(474)(iv).

[90] *WRC-15 Notice*, 38 FCC Rcd at 3543, para. 29.

[91] 47 CFR § 2.106(c)(128).

[92] *WRC-15 Notice*, 38 FCC Rcd at 3543-44, para. 30. *See also* Letter from Peter A. Tenhula, Acting Associate Administrator, Office of Spectrum Management, NTIA, to Julius P. Knapp, Chief, FCC Office of Engineering and Technology, dated Sept. 10, 2018 (*NTIA WRC-15 Final Acts Implementation Recommendations*) at 106,

(continued….)

Federal use; the 10-10.45 GHz band is allocated to the amateur and radiolocation services on a secondary basis for non-Federal use; the 10.45-10.5 GHz band is allocated to the amateur, amateur-satellite, and radiolocation services on a secondary basis for non-Federal use; and the 9.975-10.025 GHz band is allocated to the meteorological-satellite service on a secondary basis for use by weather radars for Federal and non-Federal use.[93] US128 currently prohibits pulsed emissions in the 10-10.5 GHz band, except for weather radars onboard meteorological satellites in the 10-10.025 GHz sub-band.[94] We received no comments on this proposal and revise footnote US128 to permit DOD's development of pulsed emissions systems for the military services in the 10-10.5 GHz band to help meet future system needs.

6. Revision of the 18.142-19.3 GHz, 28.5-29.1 GHz, and 29.25-29.5 GHz Bands

26. The Commission sought comment in the *WRC-15 Notice* on revising footnote NG62[95] to permit grandfathered fixed stations in the 28.5-29.1 GHz and 29.25-29.5 GHz bands to operate on a secondary basis; updating footnote US139[96] and the related service rules to reflect that incumbent fixed stations in the 18.3-19.3 GHz band no longer have primary status; raising the secondary non-Federal fixed-satellite service (space-to-Earth) allocation in the 18.142-18.3 GHz band to co-primary status with the fixed service; and amending US139 to allow certain fixed stations to continue to operate indefinitely under existing conditions.[97]

27. First, we revise footnote NG62 to permit grandfathered fixed stations to operate on a secondary basis in the 28.5-29.1 GHz and 29.25-29.5 GHz bands, which prioritizes fixed-satellite services operating in the band. Footnote NG62 currently states that, in the 28.5-29.1 GHz and 29.25-29.5 GHz bands, stations in the fixed-satellite service shall not cause harmful interference to, or claim protection from, stations in the fixed service operating under 18 listed call signs.[98] The Commission proposed to amend footnote NG62 to permit fixed stations authorized pursuant to the 10 listed call signs that currently operate in these bands to continue to operate indefinitely on a secondary basis. The Commission adopted NG62 when it deleted the primary fixed and mobile service allocations from the 28.35-29.1 GHz and 29.25-29.5 GHz bands in the non-Federal Table of Frequency Allocations.[99] We additionally note that the Commission's rules permit earth stations in motion (ESIMs) to operate in these frequency bands.[100] The proposed secondary status of these fixed stations would recognize that ESIMs, which may operate anywhere without coordination with the fixed stations, may cause intermittent interference to these fixed

https://www.fcc.gov/ecfs/document/1011648016344/1; Aug. 18, 2021 e-mail from Charles Cooper, Associate Administrator Office of Spectrum Management, NTIA, to Ronald Repasi, Acting Chief, Office of Engineering and Technology, FCC, attachment at 1.

[93] 47 CFR § 2.106(a), (b)(479).

[94] 47 CFR § 2.106(a), (c)(128) (the secondary amateur, amateur-satellite, and non-Federal radiolocation services, which shall not cause harmful interference to the Federal radiolocation service, are the only non-Federal services permitted in the 10-10.5 GHz band, and the non-Federal radiolocation service is limited to survey operations as specified in footnote US108 (47 CFR § 2.106(c)(108))).

[95] 47 CFR § 2.106(d)(62).

[96] 47 CFR § 2.106(c)(139).

[97] *WRC-15 Notice*, 38 FCC Rcd at 3544-45, paras. 32-33.

[98] 47 CFR § 2.106(d)(62). On Sept. 4, 2024, Commission staff conducted a Site Based Search of the Universal Licensing System (ULS) and found that ten licenses authorize common carrier fixed point-to-point microwave (radio service code CF) operations in the 28.5-29.1 GHz and 29.25-29.5 GHz bands. Specifically, one license authorizes operational fixed use (station class FXO) in the 28.5-29.5 GHz band in Honolulu, Hawaii (call sign WML443) and nine licenses authorize temporary fixed operations (station class FX5) in the 29.1-29.5 GHz band in a total of 15 states (call signs KIL20, KME49, KQG58, KQH74, KSA96, KSE73, KZS88, WMP367, and WSL69).

[99] *See Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, 32 FCC Rcd 7809, 7816, para. 22, n.51.

[100] 47 CFR § 25.202(a)(10)(i)-(ii).

stations. Only one commenter, Iridium, addresses this proposal. Iridium contends that when the Commission adopted its Ka-band (29.1-29.5 GHz) plan in 2017, it plainly intended for the band to be used primarily for satellite feeder links.[101] Iridium further states that the proposal would clearly establish the status of the grandfathered terrestrial stations by stating that they are secondary to satellite operations in the 29.1-29.5 GHz band.[102] Given the fact that only 10 of the 18 legacy fixed stations continue to operate in the band, amending NG62 to prioritize satellite operations ultimately rationalizes the relative priorities for services in the 28.5-29.1 GHz and 29.25-29.5 GHz bands.

28. As proposed, we amend footnote US139[103] to state that, in the 18.3-19.3 GHz band, earth station licensees in the fixed-satellite service (space-to-earth) may require that licensees of grandfathered stations in the fixed service cease operations, consistent with the provisions in section 101.95 of the Commission's rules. The Commission made this proposal because, in the 18.3-19.3 GHz band, there is no fixed service allocation and there are no longer any primary grandfathered fixed stations.[104] The Commission also proposed to revise sections 74.502(c), 74.602(g), 78.18(a)(4), and 101.147(r) of the rules in order to update the introductory text and the frequencies that are available to applicants of aural broadcast auxiliary stations, television broadcast auxiliary stations, cable television relay service, and fixed microwave services, respectively.[105] While most of the proposed changes would remove channels that are no longer allocated to the fixed service, in one instance the Commission proposed to add replacement channels, i.e., the Commission proposed replacing the 12 frequency pairs in section 74.502(c)(1)(i) of the rules with the 5-megahertz channels from section 101.147(r)(5). The Commission also proposed to update sections 101.95(a) and 101.147(a) to remove expired text and to remove sections 101.83 through 101.91 and 101.97, which concern expired policies governing fixed service relocation from the 18.3-19.3 GHz band. We received no comment on these proposals and, due to the absence of both a fixed allocation and the lack of any primary grandfathered fixed stations operating in the band, we amend our rules to update the 18.3-18.9 GHz band as proposed. We will also revise sections 74.502(c), 74.602(g), 78.18(a)(4), and 101.147(r) of the rules in order to update the introductory text and the frequencies that are available to applicants of aural broadcast auxiliary stations, television broadcast auxiliary stations, cable television relay service, and fixed microwave services. Lastly, we will adopt our

[101] *See Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, 32 FCC Rcd at 7816 (indicating that the grandfathered stations would be allowed to continue operating in the band "as authorized," which would have required them to coordinate with FSS users per the explicit conditions of their licenses); Iridium NPRM Comments at 4. Contrary to the Ka-band plan parameters that Iridium noted in its comments, we note that the Commission's Ka-band plan in 2017 covered the 27.5-29.5 GHz band. *See Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, 32 FCC Rcd 7809, 7816, para. 22, n.51.

[102] *See* Iridium NPRM Comments at 4. Iridium's comments only mentioned the 29.1-29.5 GHz band.

[103] 47 CFR § 2.106(c)(139).

[104] Specifically, section 101.85 states that fixed service operations in the 18.3-18.58 GHz and 18.58-19.3 GHz bands that remain co-primary under the provisions of sections 74.502(c), 74.602(g), 78.18(a)(4), and 101.147(r) will continue to be co-primary with the fixed-satellite service (FSS) until dates that have long since passed, i.e., these transition periods have concluded. In addition, section 101.95(a), which concerns the sunset provisions for the 18.3-19.3 GHz band, includes the following: Once the relocation rules sunset, an FSS licensee may require the incumbent to cease operations, provided that the FSS licensee intends to turn on a system within interference range of the incumbent, as determined by TIA Bulletin 10-F or any standard successor. FSS licensee notification to the affected FS [fixed service] licensee must be in writing and must provide the incumbent with no less than six months to vacate the spectrum. After the six-month notice period has expired, the FS licensee must turn its license back into the Commission, unless the parties have entered into an agreement that allows the FS licensee to continue to operate on a mutually agreed upon basis. 47 CFR §§ 101.85(b)(1)-(2), 101.95(a).

[105] These proposals are consistent with the Commission's previous decision concerning the re-channelization of the 17.7-18.3 GHz and 19.3-19.7 GHz bands for fixed microwave services under part 101 of the rules. *Rechannelization of the 17.7-19.7 GHz Frequency Band for Fixed Microwave Services under Part 101 of the Commission's Rules*, WT Docket No. 04-143, Report and Order, 21 FCC Rcd 10900 (2006), (FCC 06-141).

proposal to replace the 12 frequency pairs in section 74.502(c)(1)(i) of the rules with 5-megahertz channels from section 101.147(r)(5), as well as make the aforementioned updates to section 101.91 and 101.97 to remove expired language.

29. We also adopt our proposal to raise the non-Federal, secondary fixed-satellite service (space-to-Earth) allocation in the 18.142-18.3 GHz band to co-primary status (co-equal with the non-Federal fixed service allocation in the band). This upgrade in allocation status provides receiving earth stations with interference protection from later-licensed fixed stations used for part 74 and part 101 Multichannel Video Programming Distributor (MVPD) and part 78 cable television relay service (CARS) operations that operate in accordance with the proposed rules in this section. We received no comment on this proposal and adopt it based on our conclusion that this upgrade in allocation status will result in earth station's using this band more intensely and enhanced spectrum efficiency.[106] This action to raise the non-Federal secondary FSS (space-to-Earth) allocation in the 18.142-18.3 GHz band to primary status also aligns with NTIA's recommendation in the 18 GHz Band Report, which identified the 18 GHz band for expanded Federal and non-Federal satellite operations, consistent with the U.S. position at WRC-23.[107]

30. Lastly, the Commission sought comment on whether it should allow continued operation of existing CARS licenses that authorize operation in the 18.3-18.304 GHz and 18.3-18.334 GHz bands in Puu Nianiau, Hawaii, and Placerville, California, respectively, and to revise footnote US139[108] to codify that these fixed stations may continue to operate indefinitely under existing conditions. Again, we received no comment on these proposals and thereby allow continued operation of the aforementioned fixed stations and codify footnote US139, allowing continued, indefinite operation of these stations under existing conditions.

7. Deletion of the Radionavigation-Satellite Service from the 149.9-150.05 MHz and 399.9-400.05 MHz Bands

31. Consistent with the *WRC-15 Final Acts* and as proposed in the *WRC-15 Notice*,[109] we remove the radionavigation-satellite service allocation in the 149.9-150.05 MHz and 399.9-400.05 MHz bands from the Federal and non-Federal portions of the U.S. Table.[110] These two bands are allocated to the mobile-satellite service (Earth-to-space) and the radionavigation-satellite service, both on a primary basis, for Federal and non-Federal use.[111] The *WRC-15 Final Acts* deleted the radionavigation-satellite service allocations from the International Table in these bands because they expired on January 15, 2015, pursuant to footnote 5.224B.[112] We received no comment on this proposal. A search of the Commission's International Communications Filing System (ICFS) database revealed that that there are no RNSS licensees in the two bands. Thus, we delete the radionavigation-satellite service allocation from the two bands and retain the existing primary allocations to the mobile-satellite service (Earth-to-space) in the two bands on an exclusive basis, consistent with the *WRC-15 Final Acts*.

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[106] On September 12, 2024, Commission staff noted that there were 861 currently licensed and pending files in the International Bureau Filing System (IBFS) in the 18.142-18.3 GHz band.

[107] National Telecommunications and Information Administration, 18 GHz Band Report, NTIA Report 25-01 (March 2025), https://www.ntia.gov/sites/default/files/2025-05/18-ghz-band-study-report.pdf.

[108] 47 CFR § 2.106(c)(139).

[109] *WRC-15 Notice*, 38 FCC Rcd at 3546, para. 36.

[110] *NTIA WRC-15 Final Acts Implementation Recommendations*, Attachment 1 – Annexes 9.2b and 9.2c, at 88-89, https://www.fcc.gov/ecfs/document/1011648016344/1.

[111] 47 CFR § 2.106(a).

[112] Footnote 5.224B was adopted at the 1997 World Radiocommunication Conference. WRC-15 suppressed (i.e., deleted) footnote 5.224B from the ITU regulations in the WRC-15 Final Acts. *See WRC-15 Final Acts* at 114 (Article 5, Frequency Allocations, p. 12). https://www.itu.int/dms_pub/itu-r/opb/act/R-ACT-WRC.12-2015-PDF-E.pdf.

B. Terrestrial Issues

1. Amateur Service in the 5351.5-5366.5 kHz Band

32. In this section, we make allocation decisions regarding amateur use of the 5351.5-5366.5 kHz band and the four discrete channels at 5332, 5348, 5373, and 5405 kHz that are outside of the band, as well as the technical and operational characteristics amateurs must adhere to when utilizing the band and the four discrete channels. The *WRC-15 Final Acts* allocated the 5351.5-5366.5 kHz band to the amateur service on a secondary basis in all ITU regions and generally set a maximum radiated power at 15 watts equivalent isotropically radiated power (EIRP), equivalent to 9.15 watts effective radiated power (ERP).[113] In the *WRC-15 Notice*, the Commission sought comment on a number of proposals affecting amateur use of this band, including whether to allocate the 5351.5-5366.5 kHz band to the Amateur Radio Service on a secondary basis, whether the amateur service should keep the existing four channels at 5332, 5348, 5373, and 5405 kHz they use that are outside of the new allocation (known by amateurs as the 60-meter band), whether use and power limitations should be applied to the band, and the appropriate station class for use of the band, among others.[114]

33. Under current Commission rules, the 5275-5450 kHz band is allocated for Federal/non-Federal shared use to the fixed service on a primary basis and the mobile except aeronautical mobile service on a secondary basis.[115] Footnote US23 provides the amateur service with a secondary allocation on five discrete channels – each with a maximum bandwidth of 2.8 kilohertz and centered on frequencies 5332, 5348, 5358.5, 5373, and 5405 kHz.[116] Current Commission rules also allow stations in the amateur service to transmit on these frequencies with a maximum ERP of 100 W peak envelope power (PEP) – over ten times more powerful than WRC-15's EIRP limit.[117]

34. In 2017, the American Radio Relay League (ARRL), filed a Petition for Rulemaking asking the Commission to implement the amateur allocations provided for in the *WRC-15 Final Acts*, to retain the four amateur service channels outside of the band, to authorize amateurs General Class or above to use the contiguous band, and to retain the maximum ERP limit of 100 W PEP for use in the new

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[113] The ITU at WRC-15 adopted footnote 5.133B (47 CFR § 2.106(b)(133)(ii)), that we summarize as follows: Stations in the amateur service using the 5351.5-5366.5 kHz band must not exceed a maximum EIRP of 15 watts, except that in 33 of the 35 ITU Member States in Region 2 a higher maximum EIRP is permitted, i.e., 20 W in Mexico and 25 W in all other ITU Member States in Region 2 – except for the United States and Canada. *See WRC-15 Final Acts*, Article 5, 5 003-7 450 kHz, 5.331B, at 6-7, https://www.itu.int/dms_pub/itu-r/opb/act/R-ACT-WRC.12-2015-PDF-E.pdf. However, Canada subsequently decided to permit stations in the amateur service using the 5351.5-5366.5 kHz band and the four discrete channels at 5332, 5348, 5373, and 5405 kHz to operate with a maximum ERP of 100 W peak envelope power (PEP). *See Decision on Proposed Revisions to the Canadian Table of Frequency Allocations*, SMSE-07-18, April 2018, at 2. https://ised-isde.canada.ca/site/spectrum-management-telecommunications/sites/default/files/attachments/2022/SMSE-07-18-CTFA-2018-decision.pdf (last visited Jan. 8, 2025) ERP is the total power radiated by an antenna relative to a half wave-length dipole antenna. Theoretically, a half wave-length dipole antenna's gain is 2.15 dBi. EIRP is the total power radiated by an isotropic antenna in a single direction (dBi).

[114] *See WRC-15 Notice,* 38 FCC Rcd at 3546-48, paras. 37, 40-41. Amateur radio service licensees often refer to frequency bands by the wavelength of the radiofrequency signal. The frequency bands at issue here are often collectively referred to as the 60-meter band.

[115] 47 CFR § 2.106(a).

[116] 47 CFR § 2.106(a), (c)(23). *See also WRC-15 Notice*, 38 FCC Rcd at 3546-47, para. 38, fn.95. Although the radio frequencies of the four discrete channels at 5332, 5348, 5373, and 5405 kHz have a wavelength of 60 meters, the four channels are not part of the newly allocated 60-meter band at 5351.5-5366.5 kHz.

[117] 47 CFR § 2.106(a), (c)(23).

band.[118] NTIA recommends that we conform footnote US23 to the *WRC-15 Final Acts* by allocating the 5351.5-5366.5 kHz band to the amateur service on a secondary basis, removing the four existing amateur channels outside of this proposed new amateur band, and restricting the maximum radiated power of amateur operations in the band to 15 W EIRP (9.15 W ERP).[119]

35. *Allocation*. For the reasons stated below, we modify footnote US23 and part 97 of the Commission's rules to implement the new international allocation at 5351.5-5366.5 kHz, retain the existing four channels at 5332, 5348, 5373, and 5405 kHz that are outside of the new allocation, and do not restrict the existing secondary allocation for the existing four channels to disaster response operations.[120] The Commission first sought comment on the proposal to modify footnote US23 and part 97 of the Commission's rules to implement the new international allocation at 5351.5-5366.5 kHz and whether to retain the existing four channels at 5332, 5348, 5373, and 5405 kHz that are outside of the new allocation.[121] While commenters support the new international allocation, they are generally opposed to the removal of the four discrete channels outside of the new allocation.[122] A commenter states that the "propagation characteristics of the 60-meter band allow for more reliable communications over medium distances than other amateur bands such as the 80-meter or 40-meter bands."[123] Another commenter states that the "60-meter band has proven to be immensely valuable in facilitating public service initiatives. Its strategic positioning between the 80-meter and 40-meter amateur bands ensures reliable signal propagation to specific geographic areas, particularly during temporal and solar cycle fluctuations."[124] Commenters generally aver that the amateur radio community requires access to a range of frequencies in order to achieve long-distance propagation by refracting high frequency communications off of the ionosphere. Commenters additionally note that, depending on atmospheric conditions, signals transmitting at lower frequencies, such as the 3500-4000 kHz band, can be absorbed by the ionosphere. Conversely, there are atmospheric conditions such that operation at higher frequencies, for example the 7000-7300 kHz range, could result in signals that pass through the ionosphere completely, avoiding the desired refraction necessary for long distance reception.[125] Multiple commenters thus took issue with the Commission's statement in the *WRC-15 Notice*,[126] which characterized the internationally harmonized spectrum options at 3 and 7 MHz as being sufficient for

[118] Petition for Rule Making, ARRL, RM-11785 (filed Jan. 12, 2017) (ARRL Petition); Comments of ARRL, RM-11785 (filed March 29, 2017). The Commission issued a public notice announcing receipt of this petition on February 16, 2017. *See* Public Notice Consumer & Governmental Affairs Bureau Information Center Petition For Rulemakings Filed, Report No. 3071 (rel. Feb. 16, 2017). As of Sept. 18, 2024, there were 148 filings in RM-11785, most of which support the ARRL petition.

[119] NTIA WRC-15 Implementation Recommendations, Attachment 1 – Annex 1.4, at 29 (emphasis in original), https://www.fcc.gov/ecfs/document/1011648016344/1.

[120] Federal agencies use the larger 5275-5450 kHz band for services that include military, law enforcement, disaster relief, emergency, and contingency operations. Most non-Federal operations in the 60-meter band are part 90 industrial business pool land mobile operations. There are 44 non-Federal licenses that authorize amateur operations in the 5275-5450 kHz band. *WRC-15 Notice*, 38 FCC Rcd at 3546-47, para. 38 & nn.98, 99.

[121] *WRC-15 Notice*, 38 FCC Rcd at 3547-48, para. 40. The channel 5358.5 kilohertz is subsumed within the new band allocation at 5351.5 – 5366.5 kHz.

[122] *See* Silvercreek Amateur Radio Assoc. NPRM Comments at 1-3; Reid Crowe NPRM Comments at 1; City of Cincinnati Fire and EMS NPRM Comments at 1; Anchorage Amateur Radio Club NPRM Comments at 1.

[123] Eugene Tyler NPRM Comments at 1.

[124] Steve Kjonaas NPRM Comments at 1.

[125] Reid Crowe NPRM Comments at 1; William Akins NPRM Comments at 1.

[126] *WRC-15 Notice*, 38 FCC Rcd at 3547-48, para. 40 (stating "amateur licensees also have access to other high frequency (HF) bands at 3 and 7 MHz, so we believe there should be sufficient spectrum options for amateur operations without deviating from the internationally harmonized spectrum.").

amateur operations, with most commenters reiterating the different propagation characteristics of the bands.[127]

36. In 2003, when the Commission originally granted amateurs a secondary allocation in the 5250-5400 kHz range, the Commission stated its belief that frequencies within that range might be useful for completing disaster communications links at times when the 3 and 7 MHz bands were not available due to ionospheric conditions.[128] We continue to hold that opinion and thus allocate the 5351.5-5366.5 kHz band to the amateur radio service by modifying footnote US23 and part 97 of the Commission's rules. Additionally, we retain the existing four channels at 5332, 5348, 5373, and 5405 kHz that are outside of the new allocation for continued amateur use.

37. The Commission also sought comment on whether it should alternatively only allow amateur access to the four discrete channels at 5332, 5348, 5373, and 5405 kHz in response to disasters.[129] Amateurs participating in the Military Auxiliary Radio System (MARS) or SHAred RESources (SHARES) High Frequency (HF) Radio programs during disasters[130] or the Amateur Radio Emergency Service (ARES) or the Radio Amateur Civil Emergency Service (RACES) emergency communications programs were invited to share their proposals for whether the existing channels should continue to be used and under what conditions.[131] One commenter states that utilization of the 60-meter band channels allows the amateur community to receive up to date emergency communications from MARS stations.[132] On the other hand, another commenter states that use of the 60-meter band should be conditioned upon use for practice drills in MARS, SHARES, ARES, and RACES and that non-emergency use should not be allowed.[133] However, most commenters on this issue do not support restricting the band to emergency use and some state that, while emergency use of the band by qualified amateurs remains important, non-emergency use gives amateurs an important frequency band for continued communications.[134] We find that restricting the existing allocation to disaster response would deprive the amateur community of an important means of communication, especially in instances where ionospheric propagation characteristics at alternative high frequency bands render them potentially unusable.

38. *Channelization and Permitted Uses*. Consistent with our proposal in the *WRC-15 Notice*, we do not require the use of channelization or sub-bands in the new internationally harmonized amateur allocation.[135] In the *WRC-15 Notice*, the Commission stated that, due to the wide variety of potential applications and the need to protect other communications, dividing the band into channels or sub-bands would lead to inefficient spectrum use. The Commission also proposed that, due to the propensity of

[127] Keith Armitage NPRM Comments at 2.

[128] *In re Amendment of Parts 2 & 97 of the Commission's Rules to Create a Low Frequency Allocation for the Amateur Radio Serv.*, 18 FCC Rcd 10258, 10268 (2003).

[129] *WRC-15 Notice*, 38 FCC Rcd at 3548, para. 41.

[130] The SHARES High Frequency (HF) Radio program coordinates a voluntary network of government, industry, and disaster response agency HF radio stations used for emergency communications. *See* https://www.cisa.gov/resources-tools/programs/shared-resources-shares-high-frequency-hf-radio-program/shares-faqs (last visited May 9, 2024). MARS is a DoD program that trains, organizes, and tasks volunteer Amateur Radio operators. *See* https://www.usarmymars.org/about-army-mars (last visited Oct. 15, 2024).

[131] RACES is a radio service using amateur stations for civil defense communications during periods of local, regional, or national civil emergencies. 47 CFR § 97.3(a)(38). ARES is an ARRL program for radio amateurs who participate in emergency communications. *See* http://www.arrl.org/ares (last visited Jan. 8, 2025).

[132] Robert Partigianoni NPRM Comments at 1.

[133] James Edwin Whedbee NPRM Comments at 2.

[134] *See* Thomas Agoston NPRM Comments at1; Howard B. Patterson NPRM Comments at 1; Paul E. Krueger NPRM Comments at 1.

[135] *WRC-15 Notice*, 38 FCC Rcd at 3550-51, paras. 49-50.

some wideband digital emissions creating spectrum sharing problems, a maximum emission bandwidth of 2.8 kilohertz should be imposed on amateur operations in the band. The Commission asked commenters whether there were any other limits or technical rule changes necessary to ensure reliable and efficient use of the band.

39. Most commenters support the Commission's proposal not to channelize the new international allocation,[136] with one stating that channelization in the amateur radio service is limiting due to the varying nature of emissions depending on type (e.g., continuous wave, phone, or digital).[137] Another commenter, however, supports the notion of channelization, stating that the new 15 kilohertz band can be neatly channelized into five, 3-kilohertz channels, which would help to maintain order by letting users know where transmissions must occur.[138] Regarding other technical proposals for the band, another commenter argues against the use of continuous wave (CW)[139] transmissions, stating that they are obsolete and have not been used for primary communications in other radio services for years.[140] On the other hand, another commenter argues that the new 15 kilohertz band should not be channelized and should be restricted to narrow modes only, such as CW and digital, with no phone mode allowed on the new band.[141] One commenter expresses support for the Commission's proposal not to channelize the new 15 kilohertz band and states that any unencrypted digital operation should be allowed as long as its emission bandwidth does not exceed 2.8 kilohertz, which the commenter maintains is necessary to preserve spectrum in this narrow band.[142] Other commenters also support the Commission proposal to limit emission bandwidth to 2.8 kilohertz within the new band.[143]

40. Due to the limited contiguous allocation of 15 kilohertz, we recognize that amateur radio operators will need flexibility to utilize the new allocation. Thus, we do not require the use of channelization or sub-bands in the new allocation at 5351.5-5366.5 kHz. We also carry forward the requirement of section 97.303(h) of the Commission's rules, currently applicable to the discrete channels at 5332, 5348, 5373, and 5405 kHz, which stipulates that amateur operators shall ensure that emission bandwidth not exceed 2.8 kilohertz, which we also agree will preserve access to the limited spectrum in this secondary allocation.[144] Amateurs utilizing the discrete channels located at 5332, 5348, 5373, and 5405 kHz should already be familiar with these requirements and they have been quite successful in the mitigation of interference to primary users. We found the comments that favored channelization to be unpersuasive,[145] due to both the record reflecting substantial opposition to channelization and the fact that narrow band modes of operation allow a multitude of signals to transmit on a single 2.8 kilohertz channel.

41. *Station Class*. We limit use of the existing amateur allocations at 5332, 5348, 5373, and 5405 kHz and the new amateur allocation at 5351.5-5366.5 kHz to amateur radio operators holding a

[136] Dennis Roth NPRM Comments at 2.

[137] Silvercreek Amateur Radio Association NPRM Comments at 3.

[138] William Springer NPRM Comments at 1.

[139] CW (the abbreviation coming from the fact that it uses a Carrier Wave, or a Continuous Wave that is interrupted) is defined as international Morse code telegraphy emissions having designators with A, C, H, J or R as the first symbol; 1 as the second symbol; A or B as the third symbol; and emissions J2A and J2B. 47 CFR § 97.3(c)(1).

[140] William Springer NPRM Comments at 2.

[141] Gary Pearce NPRM Comments at 2.

[142] Dennis Roth NPRM Comments at 2.

[143] H. Ward Silver NPRM Comments at 1; TJ Sheffield NPRM Comments at 4; Janis Carson NPRM Comments at 3.

[144] *See* 47 CFR § 97.301(h).

[145] William Springer NPRM Comments at 1.

General Class license or higher.[146] The Commission proposed in the *WRC-15 Notice* that utilization of the new international allocation at 5351.5-5366.5 kHz should be limited to amateurs holding a General Class license or higher.[147] The Commission also sought comment on its proposal that if it maintains the four discrete channels at 5332, 5348, 5373, and 5405 kHz outside of the international allocation, should they too be limited to General Class licensees or higher.[148] Commenters support the Commission's proposal to limit use of the new 15 kilohertz band to General Class licensees or above, with one stating that it is necessary "due to the narrowness of the band, the need to calculate radiated power limits for the antenna configuration, and the need to understand the requirements ensuring that primary users are protected from harmful interference."[149] ARRL also suggests that use of the new international allocation and the four channels outside of that allocation should be limited to General Class licensees or higher, as "[e]ntry-level radio amateurs may not have the requisite experience to operate in accordance with the interference avoidance protocols with which much more experienced licensees will be proficient."[150]

42. We agree with commenters that utilization of the new international allocation at 5351.5-5366.5 kHz should be limited to those holding a General Class license or above. We believe that the need to protect the important Federal operations in this band requires a higher level understanding of power limitations, radiocommunications technology, operating practices, and applicable regulations. Those holding General Class licenses or above will have a better understanding of these requirements. Further, this logic extends to the four discrete channels that are outside of the 5351.5-5366.5 kHz band, and we limit utilization of these frequencies to those holding a General Class license or higher.

43. *Power*. For the reasons stated below, we do not allow the amateur community to utilize the new international allocation at 5351.5-5366.5 kHz at the requested 100 W ERP limit and adopt NTIA's proposal to limit usage of this band to 15 W EIRP, or 9.15 W ERP. Operating on a secondary basis, the amateur community must protect Federal operations in this band,[151] and we do not believe that the increased potential for harmful interference at this power limit has been fully considered at this time. Amateur access to the four discrete channels at 5332, 5348, 5373, and 5405 kHz will however, continue at the same 100 W ERP limit. In the *WRC-15 Notice*, the Commission tentatively concluded that NTIA's recommended 15 W EIRP limit would reduce the potential of harmful interference to incumbent primary operations and that the long-range propagation capabilities of the frequencies in question would likely allow efficient communications at low-power levels.[152] The Commission did, however, concede that there may be instances where more power is needed to deal with propagation challenges.[153] The Commission asked commenters seeking a power limit above the proposed 15 W EIRP to explain the appropriate power limit for the 60-meter band, if higher power levels should only be maintained during emergency drills/response, how the power limit should be defined in the Commission's rules (EIRP, ERP, or transmitter output power), and whether antenna limitations were necessary.

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[146] The General Class license is the second of three U.S. Amateur Radio licenses (the others being Technician Class, which is the entry-level class, and Extra Class, which the highest available license class for amateurs). To upgrade to General Class, you must also hold a Technician Class license (or have recently passed the Technician license exam). *See* http://www.arrl.org/upgrading-to-a-general-license.

[147] *WRC-15 Notice*, 38 FCC Rcd at 3552, para. 52.

[148] *Id*.

[149] Dennis Roth NPRM Comments at 4. Other commenters supporting General Class limitations include: William Springer NPRM Comments at 1; Joseph Rogers NPRM Comments at 1; Silvercreek Amateur Radio Assoc. NPRM Comments at 3; Janis Carson NPRM Comments at 4.

[150] *ARRL Petition* at 30. (*See supra*. note 118).

[151] *See* note 6, *supra*.

[152] *WRC-15 Notice*, 38 FCC Rcd at 3550, para 46.

[153] *Id*. at para. 47.

44. In line with ARRL's Petition for Rulemaking and proposed retention of the 100 W ERP limit for both the 15 kilohertz band at 5351.5-5366.5 kHz and the four discrete channels at 5332, 5348, 5373, and 5405 kHz outside of the new allocation,[154] most commenters argue against the proposed power reduction. Many point out that Canada has already enacted the proposals ARRL has put forth in this proceeding, namely retention of the 100 W ERP limit for the 60-meter band,[155] and that identical allocations and power limits would facilitate harmonious communications throughout most of North America.[156] Commenters argue that the 100 W ERP limit currently in place for the 60-meter band is necessary to maintain reliable communications,[157] while others state that the current power limit is necessary for emergency communications when propagation on other bands is limited by solar and earth conditions.[158] Others argue for an even larger power increase, asking the Commission to consider a 500 W ERP limit, "since lower frequencies are more susceptible to D-layer absorption and emergency communications will still need to be heard, especially in high latitude locations like Alaska."[159] Consistent with most commenters, however, is the contention that the current use of the 100 W ERP limit on the 60-meter band has not been shown to cause harmful interference to the primary users of the band, both in assigned channels and through spurious emissions outside of the allocation.[160] Some commenters argue that, due to the use of newer and more efficient digital modes, weak signals are not an impediment to sending information and the 15 W EIRP limit proposed by the NTIA is sufficient.[161] Others, however, state that amateur, non-emergency operations conducted in the four discrete channels outside of the new allocation should be restricted to the 15 W EIRP limit and that, aside from practices and drills, these channelized frequencies should not be used by the amateur community unless an actual emergency exists, at which point the 100 W ERP limit would be appropriate.[162] Another commenter states that stipulating power levels based on scenario (emergency/non-emergency, drills, etc…) would overcomplicate the issue.[163] Lastly, many commenters oppose the Commission's proposal to define the power limit in terms of EIRP to be consistent with the WRC-15 recommendation, with one commenter stating that EIRP measurements are applicable to important communication links and multi-node networks – not amateur radio.[164] Another commenter further states that the measuring standard should remain as ERP, instead of EIRP, as the ERP standard is widely used and understood in the amateur radio service.[165] One commenter argues that if an appropriate power standard such as EIRP or ERP is used, then no antenna limitations are necessary.[166]

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[154] *ARRL Petition* at 18-19. (*See supra* note 118).

[155] *See Decision on Proposed Revisions to the Canadian Table of Frequency Allocations*, SMSE-07-18, April 2018, at 2, https://ised-isde.canada.ca/site/spectrum-management-telecommunications/sites/default/files/attachments/2022/SMSE-07-18-CTFA-2018-decision.pdf (last visited Jan. 8, 2025).

[156] Ralph Anthenien NPRM Comments at 1; Bradley Sage NPRM Comments at 1; John Preku NPRM Comments at 1; Vernon Jackson NPRM Comments at 1; City of Cincinnati Fire and EMS NPRM Comments at 1.

[157] Larry Burke NPRM Comments at 1; City of Cincinnati Fire and EMS NPRM Comments at 1.

[158] John Majka NPRM Comments at 1.

[159] Larry Petty NPRM Comments at 1; TJ Sheffield NPRM Comments at 5.

[160] H. Ward Silver NPRM Comments at 2; Michael Mickelson NPRM Comments at 1.

[161] William Springer NPRM Comments at 2.

[162] James Edwin Whedbee NPRM Comments at 2.

[163] TJ Sheffield NPRM Comments at 3.

[164] Danny Jamison NPRM Comments at 17.

[165] Janis Carson NPRM Comments at 3.

[166] Dennis Roth NPRM Comments at 5

45. We agree with those commenters that support the proposed 15 W EIRP (9.15 W ERP) for the new international allocation at 5351.5-5366.5 kHz, in line with the *WRC-15 Final Acts* and the Commission's tentative conclusion in the *WRC-15 Notice*.[167] However, for consistency in part 97 and the power specification for the discrete channels we are leaving in place, we specify the power limit as 9.15 W ERP, which is equivalent to 15 W EIRP. Additionally, as stated above, allowing amateur operations in this band while fully protecting incumbent primary Federal operations is our priority, and even intermittent interference in this band could jeopardize important Federal operations. Also, the long range propagation characteristics of this band should allow for efficient communications even at low-power levels. Given, however, that ARRL's Petition for Rulemaking remains open at this time, we expect the Commission may address any necessary power adjustments for the new 15 kilohertz international allocation in that proceeding. We also allow continued amateur access to the four discrete channels at 5332, 5348, 5373, and 5405 kHz at the prevailing 100 W ERP, which was supported by the majority of commenters and which has not posed any interference issues. Further, we do not stipulate power levels based on scenario (emergency/non-emergency), as this would add unnecessary regulatory complexity. We also continue to use ERP as the measuring standard[168] – as most amateurs are familiar with this standard – and we do not adopt antenna limitations, as we believe that a radiated power limit would ensure that excess power is not used.

2. Amateur Service in the 420-450 MHz Band

46. The Commission's next proposal, based on a request from the NTIA, was to update the coordination and contact information in footnote US270 for the areas where the peak envelope power of an amateur station operating in the 420-450 MHz (70 cm) band is generally limited to 50 watts, and to revise the cross reference to this footnote in section 97.313(f) of the rules.[169]

47. We received no comment on this proposal and implement the NTIA recommendation, which will clarify compliance with our rules, by updating footnote US270 and revising the cross reference to this footnote in section 97.313(f) of the rules.

3. Deletion of the Broadcasting Service from the 700 MHz Band

48. We adopt the Commission's proposal to delete the broadcasting service allocations in the 698-758 MHz, 775-788 MHz, and 805-806 MHz bands from the non-Federal Table and to revise footnote NG159 by removing the reference to part 74, subpart G.[170] Comments received on this topic support the Commission's proposal to delete the broadcasting service allocations.[171] These actions are appropriate given that the transition of television broadcasting from the 698-806 MHz (700 MHz) band concluded in 2010[172] and the remaining primary fixed and mobile service allocations in the bands effectively gives the

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[167] *WRC-15 Notice*, 38 FCC Rcd at 3550, para 46.

[168] Recognizing that, while we are adopting a 15 W EIRP limit for use of the new 15 kilohertz international allocation at 5351.5-5366.5 kHz, we have also provided the amateur community with the corresponding 9.15 W ERP power limit applicable to this band.

[169] *See* e-mail from Charles Cooper, Associate Administrator, Office of Spectrum Management, NTIA, to Ronald Repasi, Acting Chief, FCC Office of Engineering and Technology, August 8, 2021, attachment at 1-2.

[170] *WRC-15 Notice*, 38 FCC Rcd at 3557, para. 63.

[171] CTIA NPRM Comments at 10; Verizon NPRM Reply Comments at 6.T-Mobile, Inc. NPRM Comments at 6

[172] Between 1998 and 2010, the Commission transitioned the 700 MHz band from television broadcasting use (i.e., TV channels 52-69) to public safety and mobile broadband uses. *See Reallocation of Television Channels 60-69, the 746-806 MHz Band*, 12 FCC Rcd 22953 (1998); *Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59)*, 17 FCC Rcd 1022 (2002); *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands*, 22 FCC Rcd 5289 (2007); *Amendment of Parts 1, 2, 25, 73, 74, 90, and 97 of the Commission's Rules to Make Non-Substantive Editorial Revisions to the Table of Frequency Allocations and to Various Service Rules*, 23 FCC Rcd 3775, 3785 para. 27 (2008); and *Revisions to Rules Authorizing the Operation of Low Power Auxiliary*

(continued….)

licensees in those bands the flexibility to provide broadcasting services.[173] The Commission also asked whether it should modify the part 27 service rules to reflect the deletion of the broadcasting service allocation in the 700 MHz band. Commenters, while expressing general support, did not specifically indicate which rules should be modified.[174] We conclude that modifications to our part 27 rules to reflect the deletion of the broadcasting service allocation in the 700 MHz band are unnecessary to reflect the changes made in this Order.

4. Deletion of Footnote NG155

49. The Commission's final proposal in the Terrestrial component of the *WRC-15* Notice, concerned the removal of footnote NG155[175] from the 157.45-161.575 MHz band in the U.S. Table in section 2.106(a) and from section 2.106(d)(155) of the rules because the frequencies and frequency bands to which it applies are not currently authorized in part 80 of the Commission's rules.[176] As the International Table of Frequency Allocations has already identified frequencies for worldwide intership communications, we conclude that there is no need to specify any other frequencies for intership use. For these reasons, and the lack of any comment on the proposal, we remove footnote NG155 from section 2.106 of the rules.

C. Other Matters

50. The *WRC-15 Final Acts* also added a provision in Article 4 of the Radio Regulations (No. 4.24) to describe the use of space research service (deep space) allocations. Accordingly, in the *WRC-15 Notice*, the Commission proposed to add a new paragraph to section 2.102 of the Commission's rules to clarify that: "Space research systems intended to operate in deep space may also use the space research service (deep space) allocations, with the same status as those allocations, when the spacecraft is near the Earth, such as during launch, early orbit, flying by the Earth, and returning to the Earth." [177]

51. Commenters within the wireless industry voice concern that adding this language to section 2.102 of the Commission's rules would affect spectrum bands (Table 3 below) targeted for future wireless use by both the Commission and the NTIA's National Spectrum Strategy.[178] CTIA and T-Mobile both comment that multiple frequency bands which an updated section 2.102 would affect, such as the 2110-2120 MHz band, the 7145-7190 MHz band, the 8400-8500 MHz band, and the 12.7-13.25 GHz band, have already been allocated for wireless services 2110-2120 MHz, for example, has been

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Stations in the 698-806 MHz Band, 25 FCC Rcd 643 (2010). Specifically, the 698-758, 775-788, and 805-806 MHz bands are licensed for commercial mobile broadband use and as reflected in footnote NG34 (47 CFR § 2.106(d)(34)), the 758-775 and 788-805 MHz bands are designated for public safety use.

[173] A licensee on the Lower 700 MHz Band is permitted to provide fixed, mobile, and broadcast services. Possible uses of this spectrum include digital mobile and other new broadcast operations, fixed and mobile wireless commercial services (including FDD- and TDD-based services), as well as fixed and mobile wireless uses for private, and internal radio needs. The rules governing the Lower 700 MHz Band are generally found in the 47 CFR Part 1 and Part 27. *See* https://www.fcc.gov/wireless/bureau-divisions/mobility-division/lower-700-mhz-service.

[174] The Commission noted the following as examples sections 27.3 (Other Applicable Rule Parts), 27.4 (Terms and Definitions), 27.10 (Regulatory Status), 27.13 (License Period), 27.50 (Power Limits and Duty Cycle), and 27.55 (Power Strength Limits). 47 CFR §§ 27.3, 27.4, 27.10, 27.13, 27.50, 27.55. *See also WRC-15 notice* at para. 63.

[175] 47 CFR § 2.106(d)(155).

[176] *WRC-15 Notice*, 38 FCC Rcd at 3557-58, para. 64. Footnote NG155 states that: "The bands 159.500-159.675 MHz and 161.375-161.550 MHz are allocated to the maritime service as described in 47 CFR part 80. Additionally, the frequencies 159.550, 159.575, and 159.600 MHz are available for low-power intership communications." 47 CFR § 2.106(d)(155).

[177] ITU Radio Regulations, Vol. 1, Article 4 (Assignment and use of frequencies), No. 4.24. *WRC-15 Notice*, 38 FCC Rcd at 3558, para. 65.

[178] *See* Verizon NPRM Comments at 5-6; CTIA NPRM Comments at 9; T-Mobile, Inc. NPRM Comments at 5.

allocated for advanced wireless service (AWS) use) or are being targeted for future wireless use.[179] Both T-Mobile and Verizon ask the Commission to fully consider how the expansion of the space research (deep space) allocation would impact broader agency and U.S. priorities, including the need for additional terrestrial wireless capacity.[180] At the same time, T-Mobile does concede that an evaluation of this allocation is particularly important, as the proposed near-earth operations include mission critical launch and return to earth functions.[181]

Table 3: Frequency Bands Allocated to the Space Research Service (Deep Space) in the U.S. Table		
Band	Directional Indicator	Remarks
2110-2120 MHz	Earth-to-space	Primary allocation per footnote US252
2290-2300 MHz	Space-to-Earth	Primary Federal and non-Federal allocations
7145-7190 MHz	Earth-to-space	Primary Federal & secondary non-Federal use, Goldstone only per US262
8400-8450 MHz	Space-to-Earth	Primary Federal and secondary non-Federal allocations
12.75-13.25 GHz	Space-to-Earth	Secondary international allocation; use limited to Goldstone per US251
16.6-17.1 GHz	Earth-to-space	Secondary Federal allocation
31.8-32.3 GHz	Space-to-Earth	Primary allocation, limited to Goldstone, per footnote US262
34.2-34.7 GHz	Earth-to-space	Primary Federal & secondary non-Federal use, Goldstone only per US262

52. Given shifting spectrum priorities since the completion of the *WRC-15 Final Acts*, along with a record reflecting majority opposition to the proposals outlined in the *WRC-15 Notice*, we will not adopt the proposed expansion of the space research (deep space) allocation.

53. The Commission next sought comment on a proposal to amend section 2.1(c) of the rules to add or revise the definitions for the terms "meteorological aids land station," "meteorological aids mobile station," and "coordinated universal time" in accordance with the WRC-15 adopted definitions.[182] We received no comment on these proposals and adopt the definitions for the terms "meteorological aids land station," "meteorological aids mobile station," and "coordinated universal time" in accordance with the WRC-15 adopted definitions. We also correct a typographical error in the definition of "radiosonde" in section 2.1(c) (i.e., "ballon" should be balloon).

54. The Commission next sought comment on a proposal to amend section 2.105(d) of the rules by stating that the footnote references which appear in the U.S. table below the name(s) of the allocated service or services apply to more than one of the allocated services, or to the whole of the allocation concerned, and that the footnote references which appear to the right of the name of the allocated service are applicable to only that particular service. We received no comment on this clarifying proposal and amend section 2.105(d) accordingly.

55. Finally, in the *WRC-15 Notice,* the NTIA recommended that the Commission add a subset of international footnotes that identify specific spectrum bands for International Mobile Telecommunications (IMT) to the non-Federal table.[183] No comments were received on this subject. The Commission does not generally specify the technology that licensees must use in a particular frequency band. Identifying particular bands for IMT use in the non-Federal table would contradict this general policy. NTIA's recommended subset of international footnotes identifies specific frequency bands for

[179] T-Mobile, Inc. NPRM Comments at 5; CTIA NPRM Comments at 9.

[180] T-Mobile, Inc. NPRM Comments at 5; Verizon NPRM Comments at 5-6.

[181] T-Mobile, Inc. NPRM Comments at 5.

[182] *WRC-15 Notice*, 38 FCC Rcd at 3558, para. 66.

[183] *WRC-15 Notice*, 38 FCC Rcd at 3559, para. 68. NTIA recommends that we add references to footnotes 5.295, 5.308A, 5.431B, and 5.434 to the 470-608 MHz, 614-698 MHz, 3550-3600 MHz, and 3600-3700 MHz bands, respectively. NTIA WRC-15 Implementation Recommendations, Attachment 1 – Annex 1.1 and 1.2, at 4, 11.

IMT use but does not preclude use of the bands for other purposes or establish any priority for IMT use of the bands. Because the footnotes are merely advisory, their absence from the non-Federal table will not impact the use of these bands.

IV. PROCEDURAL MATTERS

56. *Paperwork Reduction Act Analysis*. This *Report and Order* may contain new or modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. All such requirements will be submitted to the Office of Management and Budget (OMB) for review under section 3507(d) of the PRA. OMB, the general public, and other federal agencies will be invited to comment on any new or modified information collection requirements contained in this proceeding. In addition, we note that pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, see 44 U.S.C. § 3506(c)(4), we previously sought specific comment on how the Commission might further reduce the information collection burden for small business concerns with fewer than 25 employees.

57. *Regulatory Flexibility Act*. The Regulatory Flexibility Act of 1980, as amended (RFA)[184] requires that an agency prepare a regulatory flexibility analysis for notice and comment rulemakings, unless the agency certifies that "the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities."[185] Accordingly, we have prepared a Final Regulatory Flexibility Analysis (FRFA) concerning the possible impact of the rule changes contained in this *Report and Order* on small entities. The FRFA is set forth in Appendix B.

58. *Congressional Review Act.* The Commission has determined, and the Administrator of the Office of Information and Regulatory Affairs, Office of Management and Budget, concurs, that this rule is non-major under the Congressional Review Act, 5 U.S.C. § 804(2). The Commission will send a copy of this Report & Order, etc. to Congress and the Government Accountability Office pursuant to 5 U.S.C. § 801(a)(1)(A).

59. *Ex Parte Presentations*. The proceeding shall be treated as a "permit-but-disclose" proceeding in accordance with the Commission's *ex parte* rules. Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must: (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda, or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with rule 1.1206(b). In proceedings governed by rule 1.49(f) or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (*e.g.*, .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission's *ex parte* rules.

[184] 5 U.S.C. §§ 601–612. The RFA has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

[185] 5 U.S.C. § 605(b).

60. *People with Disabilities.* To request materials in accessible formats for people with disabilities (Braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the FCC's Consumer and Governmental Affairs Bureau at 202-418-0530 (voice).

61. *Additional Information.* For additional information on this proceeding, contact Sebastian Garcia, Office of Engineering and Technology, Sebastian.garcia@fcc.gov, (202) 418-2932.

V. ORDERING CLAUSES

62. IT IS ORDERED that, pursuant to sections 1, 4(i), 4(j), 7, 301, 303(c), 303(f), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 154(j), 157, 301, 303(c), 303(f), and 303(r), this Order IS ADOPTED.[186]

63. IT IS FURTHER ORDERED that the amendments of parts 2, 25, 74, 78, 87, 90, and 101 of the Commission's rules, as set forth in Appendix A, ARE ADOPTED, effective thirty (30) days after publication in the Federal Register.

64. IT IS FURTHER ORDERED that the Commission's Office of the Secretary, SHALL SEND a copy of this Order, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

65. IT IS FURTHER ORDERED that the Commission SHALL SEND a copy of this Order in a report to be sent to Congress and the Government Accountability Office pursuant to the Congressional Review Act, see 5 U.S.C. § 801(a)(1)(A).

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

[186] Pursuant to Executive Order 14215, 90 Fed. Reg. 10447 (Feb. 20, 2025), this regulatory action has been determined to be not significant under Executive Order 12866, 58 Fed. Reg. 68708 (Dec. 28, 1993).

APPENDIX A

Final Rules

For the reasons discussed in the document above, the Federal Communications Commission amends 47 CFR parts 2, 25, 74, 78, 90, 97, and 101 as follows:

PART 2—FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

1. The authority citation for part 2 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

2. Amend § 2.1(c) by revising the definition of "Coordinated Universal Time (UTC)", and adding, in alphabetical order, definitions of "Meteorological aids land station," "Meteorological aids mobile station," and "Radiosonde" to read as follows:

§ 2.1 Terms and definitions.

* * * * *

(c) * * *

Coordinated Universal Time (UTC). Time scale, based on the second (SI), as described in Resolution 655 (WRC-15).

* * * * *

Meteorological aids land station. A station in the meteorological aids service not used while in motion. (RR)

Meteorological aids mobile station. A station in the meteorological aids service used while in motion or during halts at unspecified points. (RR)

* * * * *

Radiosonde. An automatic radio transmitter in the meteorological aids service that transmits meteorological data and is usually carried on an aircraft, free balloon, kite, or parachute. (RR)

* * * * *

3. Amend § 2.105 by revising paragraph (d)(6) and adding paragraphs (d)(7) and (8) to read as follows:

§ 2.105 United States Table of Frequency Allocations.

* * * * *

(d) * * *

(6) The footnote references that appear in the United States Table below the allocated service or services apply to more than one of the allocated services, or to the whole of the allocation concerned.

(7) The footnote references that appear to the right of the name of a service are applicable only to that particular service.

(8) The coordinates of latitude and longitude that are listed in United States, Federal, and non-Federal footnotes are referenced to the North American Datum of 1983 (NAD 83).

* * * * *

4. Amend § 2.106(a) by

a. Revising pages 22, 24, 26 through 28, 30, 32, 47, 48, and 52 of the Allocation Table;

b. Revising paragraphs (c)(13) and (23);

c. Adding paragraph (c)(78);

d. Revising paragraphs (c)(117), (128), (139), and (224);

e. Adding paragraph (c)(265);

f. Revising paragraph (c)(270);

g. Adding paragraph (c)(474);

The revisions and additions read as follows:

§ 2.106 Table of Frequency Allocations.

(a) * * *

* * * * *

137.825-138 SPACE OPERATION (space-to-Earth) 5.203C METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.209 5.204 5.205 5.206 5.207 5.208			137.825-138 SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Mobile-satellite (space-to-Earth) US319 US320 5.208		
138-143.6 AERONAUTICAL MOBILE (OR) 5.210 5.211 5.212 5.214	138-143.6 FIXED MOBILE RADIOLOCATION Space research (space-to-Earth)	138-143.6 FIXED MOBILE Space research (space-to-Earth) 5.207 5.213	138-144 FIXED MOBILE	138-144	
143.6-143.65 AERONAUTICAL MOBILE (OR) SPACE RESEARCH (space-to-Earth) 5.211 5.212 5.214	143.6-143.65 FIXED MOBILE RADIOLOCATION SPACE RESEARCH (space-to-Earth)	143.6-143.65 FIXED MOBILE SPACE RESEARCH (space-to-Earth) 5.207 5.213			
143.65-144 AERONAUTICAL MOBILE (OR) 5.210 5.211 5.212 5.214	143.65-144 FIXED MOBILE RADIOLOCATION Space research (space-to-Earth)	143.65-144 FIXED MOBILE Space research (space-to-Earth) 5.207 5.213	G30		
144-146 AMATEUR AMATEUR-SATELLITE 5.216			144-148	144-146 AMATEUR AMATEUR-SATELLITE	Amateur Radio (97)
146-148 FIXED MOBILE except aeronautical mobile (R)	146-148 AMATEUR 5.217	146-148 AMATEUR FIXED MOBILE 5.217		146-148 AMATEUR	
148-149.9 FIXED MOBILE except aeronautical mobile (R) MOBILE-SATELLITE (Earth-to-space) 5.209 5.218 5.218A 5.219 5.221	148-149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.209 5.218 5.218A 5.219 5.221		148-149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) US319 US320 US323 US325 5.218 5.219 G30	148-149.9 MOBILE-SATELLITE (Earth-to-space) US320 US323 US325 5.218 5.219 US319	Satellite Communications (25)
149.9-150.05 MOBILE-SATELLITE (Earth-to-space) 5.209 5.220			149.9-150.05 MOBILE-SATELLITE (Earth-to-space) US319 US320		

150.05-153 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149	150.05-154 FIXED MOBILE 5.225	150.05-150.8 FIXED MOBILE US73 G30	150.05-150.8 US73	Page 22

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157.3375-161.7875 FIXED MOBILE except aeronautical mobile 5.226	157.3375-161.7875 FIXED MOBILE 5.226			5.226 NG111	
				157.45-161.575 FIXED LAND MOBILE NG28 NG111 NG112 5.226 NG6 NG70 NG124 NG148	Public Mobile (22) Remote Pickup (74D) Maritime (80) Private Land Mobile (90)
			161.575-161.625 5.226 US52	161.575-161.625 MARITIME MOBILE 5.226 US52 NG6 NG17	Public Mobile (22) Maritime (80)
			161.625-161.9625	161.625-161.775 LAND MOBILE NG6 5.226	Public Mobile (22) Remote Pickup (74D) Low Power Auxiliary (74H)
161.7875-161.9375 FIXED MOBILE except aeronautical mobile Maritime mobile-satellite 5.208A 5.208B 5.228AB 5.228AC 5.226	161.7875-161.9375 FIXED MOBILE Maritime mobile-satellite 5.208A 5.208B 5.228AB 5.228AC 5.226			161.775-161.9625 MOBILE except aeronautical mobile US266 NG6	Maritime (80) Private Land Mobile (90)
161.9375-161.9625 FIXED MOBILE except aeronautical mobile Maritime mobile-satellite (Earth-to-space) 5.228AA 5.226	161.9375-161.9625 FIXED MOBILE Maritime mobile-satellite (Earth-to-space) 5.228AA 5.226		US266	5.226	
161.9625-161.9875 FIXED MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.228F 5.226 5.228A 5.228B	161.9625-161.9875 AERONAUTICAL MOBILE (OR) MARITIME MOBILE MOBILE-SATELLITE (Earth-to-space) 5.228C 5.228D	161.9625-161.9875 MARITIME MOBILE Aeronautical mobile (OR) 5.228E Mobile-satellite (Earth-to-space) 5.228F 5.226	161.9625-161.9875 AERONAUTICAL MOBILE (OR) (AIS 1) MARITIME MOBILE (AIS 1) MOBILE-SATELLITE (Earth-to-space) (AIS 1) 5.228C US52		Satellite Communications (25) Maritime (80)
161.9875-162.0125 FIXED MOBILE except aeronautical mobile Maritime mobile-satellite (Earth-to-space) 5.228AA 5.226 5.229	161.9875-162.0125 FIXED MOBILE Maritime mobile-satellite (Earth-to-space) 5.228AA 5.226		161.9875-162.0125	161.9875-162.0125 MOBILE except aeronautical mobile 5.226	Maritime (80)

162.0125-162.0375 FIXED MOBILE except aeronautical mobile Mobile-satellite (Earth-to-space) 5.228F 5.226 5.228A 5.228B 5.229	162.0125-162.0375 AERONAUTICAL MOBILE (OR) MARITIME MOBILE MOBILE-SATELLITE (Earth-to-space) 5.228C 5.228D	162.0125-162.0375 MARITIME MOBILE Aeronautical mobile (OR) 5.228E Mobile-satellite (Earth-to-space) 5.228F 5.226	162.0125-162.0375 AERONAUTICAL MOBILE (OR) (AIS 2) MARITIME MOBILE (AIS 2) MOBILE-SATELLITE (Earth-to-space) (AIS 2) 5.228C US52	Satellite Communications (25) Maritime (80) Page 24

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235-267 FIXED MOBILE 5.111 5.252 5.254 5.256 5.256A	235-267 FIXED MOBILE 5.111 5.256 G27 G100	235-267 5.111 5.256	
267-272 FIXED MOBILE Space operation (space-to-Earth) 5.254 5.257	267-322 FIXED MOBILE	267-322	
272-273 SPACE OPERATION (space-to-Earth) FIXED MOBILE 5.254			
273-312 FIXED MOBILE 5.254			
312-315 FIXED MOBILE Mobile-satellite (Earth-to-space) 5.254 5.255			
315-322 FIXED MOBILE 5.254	G27 G100		
322-328.6 FIXED MOBILE RADIO ASTRONOMY 5.149	322-328.6 FIXED MOBILE US342 G27	322-328.6 US342	
328.6-335.4 AERONAUTICAL RADIONAVIGATION 5.258 5.259	328.6-335.4 AERONAUTICAL RADIONAVIGATION 5.258		Aviation (87)
335.4-387 FIXED MOBILE 5.254	335.4-399.9 FIXED MOBILE	335.4-399.9	
387-390			

FIXED MOBILE Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.254 5.255			
390-399.9 FIXED MOBILE 5.254	G27 G100		
399.9-400.05 MOBILE-SATELLITE (Earth-to-space) 5.209 5.220 5.260A 5.260B	399.9-400.05 MOBILE-SATELLITE (Earth-to-space) US320		Satellite Communications (25) Page 26

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
400.05-400.15 STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz) 5.261 5.262			400.05-400.15 STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz) 5.261		
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401-402 METEOROLOGICAL AIDS SPACE OPERATION (space-to-Earth) EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Fixed Mobile except aeronautical mobile 5.264A 5.264B			401-402 METEOROLOGICAL AIDS (radiosonde) US70 SPACE OPERATION (space-to-Earth) EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) US64 US384	401-402 METEOROLOGICAL AIDS (radiosonde) US70 SPACE OPERATION (space-to-Earth) Earth exploration-satellite (Earth-to-space) Meteorological-satellite (Earth-to-space) US64 US384	MedRadio (95I)

402-403 METEOROLOGICAL AIDS EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) Fixed Mobile except aeronautical mobile 5.264A 5.264B	402-403 METEOROLOGICAL AIDS (radiosonde) US70 EARTH EXPLORATION-SATELLITE (Earth-to-space) METEOROLOGICAL-SATELLITE (Earth-to-space) US64 US384	402-403 METEOROLOGICAL AIDS (radiosonde) US70 Earth exploration-satellite (Earth-to-space) Meteorological-satellite (Earth-to-space) US64 US384	
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455-456 FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	455-456 FIXED MOBILE 5.286AA MOBILE-SATELLITE (Earth-to-space) 5.286A 5.286B 5.286C 5.209	455-456 FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E		455-456 LAND MOBILE US64	Remote Pickup (74D) Low Power Auxiliary (74H) MedRadio (95I)

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5.149 5.291A 5.294 5.296 5.300 5.304 5.306 5.312 694-790 MOBILE except aeronautical mobile 5.312A 5.317A BROADCASTING	614-698 BROADCASTING Fixed Mobile 5.293 5.308 5.308A 5.309	614-890	614-698 FIXED MOBILE Mobile-satellite NG33A NG5 NG14 NG33 NG115 NG149	RF Devices (15) Satellite Communications (25) Wireless Communications (27) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H)
	698-806 MOBILE 5.317A BROADCASTING Fixed		698-758 FIXED MOBILE Mobile-satellite NG33A NG159	Satellite Communications (25) Wireless Communications (27) LPTV and TV Translator (74G)
			758-775 FIXED MOBILE Mobile-satellite NG33A NG34 NG159	Satellite Communications (25) Public Safety Land Mobile (90R)

				775-788 FIXED MOBILE Mobile-satellite NG33A NG159	Satellite Communications (25) Wireless Communications (27) LPTV and TV Translator (74G)
5.300 5.312				788-805 FIXED MOBILE Mobile-satellite NG33A NG34 NG159	Satellite Communications (25) Public Safety Land Mobile (90R)
790-862 FIXED MOBILE except aeronautical mobile 5.316B 5.317A BROADCASTING				805-806 FIXED MOBILE Mobile-satellite NG33A NG159	Satellite Communications (25) Wireless Communications (27) LPTV and TV Translator (74G)
	5.293 5.309			806-809 LAND MOBILE	Public Safety Land Mobile (90S)
	806-890 FIXED MOBILE 5.317A BROADCASTING			809-849 FIXED LAND MOBILE Mobile-satellite NG33A	Public Mobile (22) Satellite Communications (25) Private Land Mobile (90)
				849-851 AERONAUTICAL MOBILE	Public Mobile (22)
				851-854 LAND MOBILE	Public Safety Land Mobile (90S)
5.312 5.319				854-894 FIXED LAND MOBILE Mobile-satellite NG33A	Public Mobile (22) Satellite Communications (25) Private Land Mobile (90)
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			US116 US268 G2	940-941 FIXED MOBILE US116 US268	Personal Communications (24)
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942-960 FIXED	942-960 FIXED	942-960 FIXED	941-944 FIXED US84 US268 US301 G2	941-944 FIXED	Public Mobile (22)

MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322 5.323	MOBILE 5.317A	MOBILE 5.317A BROADCASTING 5.320		US84 US268 US301 NG30 NG35	Aural Broadcast Auxiliary (74E) Low Power Auxiliary (74H) Fixed Microwave (101)
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1164-1215 AERONAUTICAL RADIONAVIGATION 5.328 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.328A			1164-1215 AERONAUTICAL RADIONAVIGATION 5.328 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328A US224		
1215-1240 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A SPACE RESEARCH (active) 5.330 5.331 5.332			1215-1240 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION G56 RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) G132 SPACE RESEARCH (active) 5.332	1215-1240 Earth exploration-satellite (active) Space research (active)	
1240-1300 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.328B 5.329 5.329A SPACE RESEARCH (active) Amateur 5.282 5.330 5.331 5.332 5.335 5.335A			1240-1300 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION G56 SPACE RESEARCH (active) AERONAUTICAL RADIONAVIGATION 5.332 5.335	1240-1300 AERONAUTICAL RADIONAVIGATIO Amateur Earth exploration-satellite (active) Space research (active) 5.282	Amateur Radio (97)
1300-1350 RADIOLOCATION AERONAUTICAL RADIONAVIGATION 5.337 RADIONAVIGATION-SATELLITE (Earth-to-space) 5.149 5.337A			1300-1350 AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation G2 US342	1300-1350 AERONAUTICAL RADIONAVIGATION 5.337 US342	Aviation (87)
1350-1400 FIXED MOBILE RADIOLOCATION	1350-1400 RADIOLOCATION 5.338A		1350-1390 FIXED MOBILE RADIOLOCATION G2 5.334 5.339 US342 US385 G27 G114	1350-1390 5.334 5.339 US342 US385	
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8.75-8.85 RADIOLOCATION AERONAUTICAL RADIONAVIGATION 5.470 5.471					
8.85-9 RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.473			US53	US53	
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9.3-9.5 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION 5.475 SPACE RESEARCH (active) 5.427 5.474 5.475A 5.475B 5.476A			9.3-9.5 EARTH EXPLORATION- SATELLITE (active) RADIOLOCATION G56 RADIONAVIGATION US475 SPACE RESEARCH (active) Meteorological aids 5.427 5.474 5.475A 5.475B US67 US71 US476A	9.3-9.5 RADIONAVIGATION US475 Meteorological aids Earth exploration-satellite (active) Radiolocation Space research (active) 5.427 5.474 US67 US71 US476A	Maritime (80) Aviation (87) Private Land Mobile (90)
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15.7-16.6 RADIOLOCATION 5.512 5.513			15.7-16.6 RADIOLOCATION G59	15.7-17.2 Radiolocation	Private Land Mobile (90)
16.6-17.1 RADIOLOCATION Space research (deep space) (Earth-to-space) 5.512 5.513			16.6-17.1 RADIOLOCATION G59 Space research (deep space) (Earth-to-space)		
17.1-17.2 RADIOLOCATION 5.512 5.513			17.1-17.2 RADIOLOCATION G59		
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17.7-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A (Earth-to-space) 5.516 MOBILE	17.7-17.8 FIXED FIXED-SATELLITE (space-to-Earth) 5.517 5.517A (Earth-to-space) 5.516 BROADCASTING-SATELLITE Mobile 5.515	17.7-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A (Earth-to-space) 5.516 MOBILE	17.7-17.8 US334 G117	17.7-17.8 FIXED FIXED-SATELLITE (Earth-to-space) (space-to-Earth) NG527A US334 NG58	Satellite Communications (25) TV Broadcast Auxiliary (74F) Cable TV Relay (78)

	17.8-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A (Earth-to-space) 5.516 MOBILE 5.519		17.8-18.6 FIXED-SATELLITE (space-to-Earth) US334 G117	17.8-18.142 FIXED Fixed-satellite (space-to-Earth) NG527A US334 US519	Fixed Microwave (101)
				18.142-18.3 FIXED FIXED-SATELLITE (space-to-Earth) NG527A US334 US519	
18.1-18.4 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B 5.517A (Earth-to-space) 5.520 MOBILE 5.519 5.521				18.3-18.6 FIXED-SATELLITE (space-to-Earth) NG527A	Satellite Communications (25)
18.4-18.6 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B 5.517A MOBILE			US139 US519	US139 US334	

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(c) * * *

(13) US13 The center frequencies listed in table 2 to paragraph (c)(13), each with a channel bandwidth not greater than 12.5 kHz, are available for assignment to non-Federal fixed stations for the specific purpose of transmitting hydrological and meteorological data in cooperation with Federal agencies, subject to the condition that harmful interference will not be caused to Federal stations:

Table 2 to paragraph (c)(13):
HYDRO CHANNELS (MHZ)

169.4250	170.2250	171.0250	171.8375	412.6625
169.4375	170.2375	171.0375	171.8500	412.6750
169.4500	170.2500	171.0500	171.8625	412.6875
169.4625	170.2625	171.0625	171.8750	412.7125
169.4750	170.2750	171.0750	171.8875	412.7250
169.4875	170.2875	171.0875	171.9000	412.7375
169.5000	170.3000	171.1000	171.9125	412.7625
169.5125	170.3125	171.1125	171.9250	412.7750
169.5250	170.3250	171.1250	406.1250	415.1250
……...	……...	171.8250	406.1750	415.1750

(i) After [INSERT EFFECTIVE DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], no assignments on the frequencies 406.125 MHz and 406.175 MHz will be made, but stations with existing assignments may continue to operate on these frequencies.

(ii) [Reserved]

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(23) US23 The band 5351.5-5366.5 kHz (60 m band) is allocated to the amateur service on a secondary basis. In the band 5330.5-5406.4 kHz, the assigned frequencies 5332, 5348, 5373, and 5405 kHz are allocated to the amateur service on a secondary basis. Amateur service use of these four frequencies is restricted to a maximum effective radiated power of 100 W PEP and to the following emission types and designators: phone (2K80J3E), data (2K80J2D), RTTY (60H0J2B), and CW (150HA1A). Amateur service use of the 60m band frequencies must meet the requirements in part 97 of these rules. Amateur operators using the data and RTTY emissions must exercise care to limit the length of transmissions so as to avoid causing harmful interference to Federal stations.

* * * * *

(78) US78 Military systems used for Identification, Friend or Foe (IFF) operations are authorized to operate in the band 960-1164 MHz on center frequencies 1030 MHz for interrogators and 1090 MHz for transponders on the condition that harmful interference will not be caused to the aeronautical radionavigation service (ARNS) or the aeronautical mobile (R) service (AM(R)S). These IFF systems will be evaluated on a case-by-case basis using DoD and FAA mutually agreed upon methodologies, technical criteria, and characteristics for calculating potential interference between ARNS/AM(R)S systems and systems used for military or other National defense IFF operations. This will include using DoD and FAA

mutually agreed upon methodologies and criteria for considering the aggregation of civil and military systems in the 1030 and 1090 MHz bands in the evaluation.

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(117) US117 In the band 406.1-410 MHz, the following provisions shall apply:

(i) Stations in the fixed and mobile services are limited to a transmitter output power of 125 watts, and new authorizations for stations, other than mobile stations, are subject to prior coordination by the applicant in the following areas:

(A) Within Puerto Rico and the U.S. Virgin Islands, contact Spectrum Manager, Arecibo Observatory, HC3 Box 53995, Arecibo, PR 00612. Phone: 787-878-2612, Fax: 787-878-1861, E-mail: prcz@naic.edu.

(B) Within 350 km of the Very Large Array (34° 04' 44" N, 107° 37' 06" W), contact Spectrum Manager, National Radio Astronomy Observatory, P.O. Box O, 1003 Lopezville Road, Socorro, NM 87801. Phone: 505-835-7000, Fax: 505-835-7027, E-mail: nrao-rfi@nrao.edu.

(C) Within 10 km of the Table Mountain Observatory (40° 08' 02" N, 105° 14' 40" W) and for operations only within the sub-band 407-409 MHz, contact Radio Frequency Manager, Department of Commerce, 325 Broadway, Boulder, CO 80305. Phone: 303-497-4619, Fax: 303-497-6982, E-mail: frequencymanager@its.bldrdoc.gov.

(ii) Non-Federal use is limited to the radio astronomy service and as provided by paragraphs (c)(13) and (c)(55) of this section.

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(128) US128 In the band 10-10.5 GHz, pulsed emissions are prohibited, except for the military services, and for weather radars on board meteorological satellites in the sub-band 10-10.025 GHz. The amateur service, the amateur satellite service, and the non-Federal radiolocation service, which shall not cause harmful interference to the Federal radiolocation service, are the only non-Federal services permitted in this band. The non-Federal radiolocation service is limited to survey operations as specified in paragraph (c)(108) of this section.

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(139) US139 In the band 18.3-19.3 GHz, earth station licensees in the fixed-satellite service (space-to-Earth) may require that licensees of grandfathered stations in the fixed service cease operations in accordance with the provisions in § 101.95 of this chapter.

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(224) US224 Federal systems utilizing spread spectrum techniques for terrestrial communication, navigation, and identification may be authorized to operate in the band 960-1215 MHz on the condition that harmful interference will not be caused to the aeronautical mobile (R) and aeronautical radionavigation services in the band 960-1164 MHz, military Identification Friend or Foe (IFF) systems on center frequencies 1030/1090 MHz, aeronautical mobile-satellite (R) service (Earth-to-space) in the band 1087.7-1092.3 MHz,

and the aeronautical radionavigation and radionavigation-satellite (space-to-Earth) (space-to-space) services in the band 1164-1215 MHz. These systems will be handled on a case-by-case basis. Such systems are subject to a review at the national level for operational requirements and electromagnetic compatibility prior to development, procurement or modification.

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(265) US265 The following provisions apply in the band 403-410 MHz:

(i) New frequency assignments to stations in the fixed and mobile services will not be made within the bands 405.9-406.0 MHz and 406.1-406.2 MHz.

(ii) The frequency drift characteristics of radiosondes must be taken into account when selecting their operating frequencies above 405 MHz to avoid transmitting in the band 406-406.1 MHz and all practical steps must be taken to avoid frequency drifting close to 406 MHz.

* * * * *

(270) US270 In the band 420-450 MHz, the following provisions apply to the amateur service:

(i) The peak envelope power of an amateur station must not exceed 50 watts in the following areas, unless expressly authorized through mutual agreement, on a case-by-case basis, between the Regional Director of the applicable FCC field office and the military area frequency coordinator at the applicable military base as listed in table 1 to paragraph (c)(270)(i).

Table 1 to paragraph (c)(270)(i)

Location	Geographic limitation	Coordination contact information
Arizona	None (statewide)	DoD AFC AZ, (520) 538-6423 DoD AFC AZ – DSN – 879-6423
New Mexico	None (statewide)	DoD AFC WSMR – DSN – 258-5417 DoD AFC WSMR, (575) 678-5417, usarmy.wsmr.imcomcentral.list.dodafc@mail.mil
Texas	West of longitude 104° W	
California	South of latitude 37° 10’ N	DoD Western AFC, (760) 939-6832 DoD Western – DSN – 437-6832
Nevada	South of latitude 37° 10’ N	Nevada AFC – DSN – 875-0607 Nevada AFC, (702) 679-0607, dodafc@nellis.af.mil usaf.nellis.99-abw.mbx.dod-afcorg@mail.smil.mil
Point Mugu, CA	Within 322 km of 34° 09’ N, 119° 11’ W	NMCSO SW DSN 312-735-9889 NMCSO SW at (619)545-9978, Nctssdsdni_nmcso_southwest@navy.mil
Florida	None (statewide)	DoD Eastern – DSN – 467-8436 DoD Eastern AFC, (321) 853-8426, 45sw.dodeafc@us.af.mil
Patrick AFB, FL	Within 322 km of 28° 21’ N, 080° 43’ W	

Eglin AFB, FL	Within 322 km of 30° 30' N, 086° 30' W	DoD Gulf – DSN – 875-5648 DoD Gulf AFC, (850) 883-5982
Beale AFB, CA	Within 240 km of 39° 08' N, 121° 26' W	HQ SpOC Spectrum Management Office, (719) 554-6400, SpOC.SMO@us.af.mil HQ SpOC DSN – 692-6400
Goodfellow AFB, TX	Within 200 km of 31° 25' N, 100° 24' W	
Warner Robins AFB, GA	Within 200 km of 32° 38' N, 083° 35' W	
Clear SFS, AK	Within 160 km of 64° 17' N, 149° 10' W	
Concrete, ND	Within 160 km of 48° 43' N, 097° 54' W	
Otis AFB, MA	Within 160 km of 41° 45' N, 070° 32' W	

(ii) In the sub-band 420-430 MHz, the amateur service is not allocated north of Line A (def. § 2.1).

* * * * *

(474) US474D Stations in the Earth exploration-satellite service (active) must not cause harmful interference to, or claim protection from, stations of the maritime radionavigation service in the band 9.2-9.3 GHz and the radiolocation service in the band 9.9-10.4 GHz.

* * * * *

5. Amend § 2.106 by removing and reserving paragraph (d)(155) and revising paragraphs (d)(62) and (d)(159) to read as follows:

(d) * * *

(62) NG62 In the bands 28.5-29.1 GHz and 29.25-29.5 GHz, stations in the fixed service operating under the following call signs may operate indefinitely on a secondary basis: KIL20, KME49, KQG58, KQH74, KSA96, KSE73, KZS88, WML443, WMP367, and WSL69.

* * * * *

(159) NG159 In the band 698-806 MHz, stations authorized under part 74, subpart F of this chapter may continue to operate indefinitely on a secondary basis to all other stations operating in that band.

* * * * *

PART 25—SATELLITE COMMUNICATIONS

6. The authority citation for part 25 continues to read as follows:

Authority: 47 U.S.C. 154, 301, 302, 303, 307, 309, 310, 319, 332, 605, and 721, unless otherwise noted.

7. Amend § 25.202 by adding paragraph (a)(13) to read as follows:

§ 25.202 Frequencies, frequency tolerance, and emission limits.

(a) * * *

(13) The 1087.7-1092.3 MHz band (center frequency 1090 MHz) is available for use by the aeronautical mobile-satellite (R) service (Earth-to-space) for the reception of Automatic Dependent Surveillance-Broadcast (ADS-B) emissions from aircraft.

* * * * *

PART 74—EXPERIMENTAL RADIO, AUXILIARY, SPECIAL BROADCAST AND OTHER PROGRAM DISTRIBUTIONAL SERVICES

8. The authority citation for part 74 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, 307, 309, 310, 325, 336 and 554.

9. Amend § 74.502(c) by revising the introductory text and paragraph (1)(i) to read as follows:

§ 74.502 Frequency assignment.

* * * * *

(c) The frequencies listed in the tables found in the following paragraphs are available for assignment to aural broadcast STL and intercity relay stations. Licensees in the fixed-satellite service may require that licensees of grandfathered stations operating in the bands 18,760-18,820 MHz and 19,100-19,160 MHz cease operations in accordance with the provisions in § 101.95 of this chapter.

(1)

(i) 5 MHz maximum authorized bandwidth channels:

Table 1 to paragraph (c)(1)(i)

Transmit (receive) (MHz)	Receive (transmit) (MHz)
1560 Megahertz Separation	
17702.5	n/a
17707.5	n/a
17712.5	n/a
17717.5	n/a
17722.5	n/a
17727.5	n/a
17732.5	n/a
17737.5	n/a
18062.5	19622.5
18067.5	19627.5
18072.5	19632.5
18077.5	19637.5
18082.5	19642.5
18087.5	19647.5
18092.5	19652.5
18097.5	19657.5
18102.5	19662.5

18107.5	19667.5
18112.5	19672.5
18117.5	19677.5
18122.5	19682.5
18127.5	19687.5
18132.5	19692.5
18137.5	19697.5

* * * * *

10. Amend § 74.602 by removing and reserving paragraph (g)(2) and revising the introductory text of paragraph (g) and paragraphs (g)(3) through (6) to read as follows:

§ 74.602 Frequency assignment.

* * * * *

(g) The frequencies listed in the tables found in the following paragraphs are available for assignment to television STL, television relay stations, and television translator relay stations. Licensees may use either a two-way link or one or both frequencies of a frequency pair for a one-way link and must coordinate proposed operations pursuant to procedures required in § 101.103(d) of this chapter. Licensees in the fixed-satellite service may require that licensees of grandfathered stations operating in the 18.3-18.58 GHz and 19.26-19.3 GHz bands cease operations in accordance with the provisions in § 101.95 of this chapter.

* * * * *

(3) 10 MHz maximum authorized bandwidth channels:

Table 4 to paragraph (g)(3)

Transmit (receive) (MHz)	**Receive (transmit) (MHz)**
1560 MHz Separation	
17705.0	n/a
17715.0	n/a
17725.0	n/a
17735.0	n/a
17745.0	19305.0
17755.0	19315.0
17765.0	19325.0
17775.0	19335.0
17785.0	19345.0
17795.0	19355.0
17805.0	19365.0
17815.0	19375.0
17825.0	19385.0
17835.0	19395.0
17845.0	19405.0

17855.0	19415.0
17865.0	19425.0
17875.0	19435.0
17885.0	19445.0
17895.0	19455.0
17905.0	19465.0
17915.0	19475.0
17925.0	19485.0
17935.0	19495.0
17945.0	19505.0
17955.0	19515.0
17965.0	19525.0
17975.0	19535.0
17985.0	19545.0
17995.0	19555.0
18005.0	19565.0
18015.0	19575.0
18025.0	19585.0
18035.0	19595.0
18045.0	19605.0
18055.0	19615.0
18065.0	19625.0
18075.0	19635.0
18085.0	19645.0
18095.0	19655.0
18105.0	19665.0
18115.0	19675.0
18125.0	19685.0
18135.0	19695.0

(4) 20 MHz maximum authorized bandwidth channels:

Table 5 to paragraph (g)(4)

Transmit (receive) (MHz)	**Receive (transmit) (MHz)**
1560 MHz Separation	
17710.0	n/a
17730.0	n/a
17750.0	19310.0
17770.0	19330.0
17790.0	19350.0
17810.0	19370.0
17830.0	19390.0
17850.0	19410.0
17870.0	19430.0

17890.0	19450.0
17910.0	19470.0
17930.0	19490.0
17950.0	19510.0
17970.0	19530.0
17990.0	19550.0
18010.0	19570.0
18030.0	19590.0
18050.0	19610.0
18070.0	19630.0
18090.0	19650.0
18110.0	19670.0
18130.0	19690.0

(5) 40 MHz maximum authorized bandwidth channels:

Table 6 to paragraph (g)(5)

Transmit (receive) (MHz)	**Receive (transmit) (MHz)**
1560 MHz Separation	
17720.0	n/a
17760.0	19320.0
17800.0	19360.0
17840.0	19400.0
17880.0	19440.0
17920.0	19480.0
17960.0	19520.0
18000.0	19560.0
18040.0	19600.0
18080.0	19640.0
18120.0	19680.0

(6) 80 MHz maximum authorized bandwidth channels:

Table 7 to paragraph (g)(6)

Transmit (receive) (MHz)	**Receive (transmit) (MHz)**
1560 MHz Separation	
17740.0	n/a
17820.0	19380.0
17900.0	19460.0
17980.0	19540.0
18060.0	19620.0

* * * * *

PART 78—CABLE TELEVISION RELAY SERVICE

11. The authority citation for part 78 continues to read as follows:

Authority: 47 U.S.C. 152, 153, 154, 301, 303, 307, 308, 309.

12. Amend § 78.18 by removing and reserving paragraph (a)(4)(ii) and revising the introductory text of paragraph (a)(4), and paragraphs (a)(4)(iii) through (vi) to read as follows:

§ 78.18 Frequency assignments.

(a) * * *

(4) The Cable Television Relay Service is also assigned frequencies in the 17,700-18,300 MHz and 19,300-19,700 MHz bands as listed in the tables found in the following paragraphs. These frequencies are co-equally shared with stations in other services under parts 25, 74, and 101 of this chapter. Licensees in the fixed-satellite service may require that licensees of grandfathered stations operating in the 18.3-18.58 GHz and 19.26-19.3 GHz bands cease operations in accordance with the provisions in § 101.95 of this chapter.

* * * * *

(iii) 10 MHz maximum authorized bandwidth channels:

Table 10 to paragraph (a)(4)(iii)

Transmit (receive) (MHz)	Receive (transmit) (MHz)
1560 MHz Separation	
17705.0	n/a
17715.0	n/a
17725.0	n/a
17735.0	n/a
17745.0	19305.0
17755.0	19315.0
17765.0	19325.0
17775.0	19335.0
17785.0	19345.0
17795.0	19355.0
17805.0	19365.0
17815.0	19375.0
17825.0	19385.0
17835.0	19395.0
17845.0	19405.0
17855.0	19415.0
17865.0	19425.0
17875.0	19435.0

17885.0	19445.0
17895.0	19455.0
17905.0	19465.0
17915.0	19475.0
17925.0	19485.0
17935.0	19495.0
17945.0	19505.0
17955.0	19515.0
17965.0	19525.0
17975.0	19535.0
17985.0	19545.0
17995.0	19555.0
18005.0	19565.0
18015.0	19575.0
18025.0	19585.0
18035.0	19595.0
18045.0	19605.0
18055.0	19615.0
18065.0	19625.0
18075.0	19635.0
18085.0	19645.0
18095.0	19655.0
18105.0	19665.0
18115.0	19675.0
18125.0	19685.0
18135.0	19695.0

(iv) 20 MHz maximum authorized bandwidth channels:

Table 11 to paragraph (a)(4)(iv)

Transmit (receive) (MHz)	**Receive (transmit) (MHz)**
1560 MHz Separation	
17710.0	n/a
17730.0	n/a
17750.0	19310.0
17770.0	19330.0
17790.0	19350.0
17810.0	19370.0
17830.0	19390.0
17850.0	19410.0
17870.0	19430.0
17890.0	19450.0
17910.0	19470.0

17930.0	19490.0
17950.0	19510.0
17970.0	19530.0
17990.0	19550.0
18010.0	19570.0
18030.0	19590.0
18050.0	19610.0
18070.0	19630.0
18090.0	19650.0
18110.0	19670.0
18130.0	19690.0

(v) 40 MHz maximum authorized bandwidth channels:

Table 12 to paragraph (a)(4)(v)

Transmit (receive) (MHz)	Receive (transmit) (MHz)
1560 MHz Separation	
17720.0	n/a
17760.0	19320.0
17800.0	19360.0
17840.0	19400.0
17880.0	19440.0
17920.0	19480.0
17960.0	19520.0
18000.0	19560.0
18040.0	19600.0
18080.0	19640.0
18120.0	19680.0

(vi) 80 MHz maximum authorized bandwidth channels:

Table 13 to paragraph (a)(4)(vi)

Transmit (receive) (MHz)	Receive (transmit) (MHz)
1560 MHz Separation	
17740.0	n/a
17820.0	19380.0
17900.0	19460.0
17980.0	19540.0
18060.0	19620.0

* * * * *

PART 87 – AVIATION SERVICES

13. The authority citation for part 87 continues to read as follows:

Authority: 47 U.S.C. 154, 303 and 307(e), unless otherwise noted.

14. Amend § 87.5 by revising the definition of "Automatic dependent surveillance—broadcast (ADS-B) Service" to read as follows:

* * * * *

Automatic dependent surveillance—broadcast (ADS-B) Service. Broadcast transmissions from aircraft, supporting aircraft-to-aircraft, aircraft-to-ground, or aircraft-to-space station surveillance applications, including position reports, velocity vector, intent, and other relevant information about the aircraft.

* * * * *

15. Amend § 87.479 by revising the section heading and paragraphs (a) and (b) to read as follows:

§ 87.479 Harmful interference to radionavigation land stations or aeronautical mobile route service stations.

(a) Military or other Government stations have been authorized to establish wide-band systems using frequency-hopping spread spectrum techniques in the 960-1215 MHz band. Authorization for a Joint Tactical Information Distribution Systems (JTIDS) is permitted on the basis of non-interference to the aeronautical radionavigation service and aeronautical mobile-satellite (route) service (Earth-to-space) in this band. In order to accommodate the requirements for the system within the band, restrictions are imposed. Transmissions will be automatically prevented if:

* * * * *

(b) If radionavigation systems operating in the 960-1215 MHz band or aeronautical mobile-satellite (route) service (Earth-to-space) systems operating in the 960-1164 MHz band experience interference or unexplained loss of equipment performance, the situation must be reported immediately to the nearest office of the FAA, the National Telecommunications and Information Administration, Washington, DC 20504, or the nearest Federal Communications Commission field office. The following information must be provided to the extent available:

* * * * *

PART 90—PRIVATE LAND MOBILE RADIO SERVICES

16. The authority citation for part 90 continues to read as follows:

Authority: 47 U.S.C. 154(i), 161, 303(g), 303(r), 332(c)(7), 1401-1473.

17. Amend § 90.265 by revising paragraph (a)(8) to read as follows:

§ 90.265 Assignment and use of frequencies in the bands allocated for Federal use.

(a) * * *

(8) After [INSERT DATE 30 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER], no assignments for the frequencies 406.1250 MHz and 406.1750 MHz will be made, but stations with existing assignments may continue to operate on these frequencies.

* * * * *

PART 97—AMATEUR RADIO SERVICE

18. The authority citation for part 97 continues to read as follows:

Authority: 47 U.S.C. 151-155, 301-609, unless otherwise noted.

19. Amend § 97.301 by revising the entry for the "60 m" wavelength band in the table in paragraphs (b) through (d) to read as follows:

§ 97.301 Authorized frequency bands.

* * * * *

(b) * * *

Wavelength band	ITU Region 1	ITU Region 2	ITU Region 3	Sharing requirements see § 97.303 (Paragraph)
* * * * * * *				
HF	MHz	MHz	MHz	
* * * * * * *				
60 m	5.3515-5.3665	5.3515-5.3665	5.3515-5.3665	(h)
* * * * * * *				

(c) * * *

Wavelength band	ITU Region 1	ITU Region 2	ITU Region 3	Sharing requirements see § 97.303 (Paragraph)
* * * * * * *				
HF	MHz	MHz	MHz	
* * * * * * *				
60 m	5.3515-5.3665	5.3515-5.3665	5.3515-5.3665	(h)
* * * * * * *				

(d) * * *

Wavelength band	ITU Region 1	ITU Region 2	ITU Region 3	Sharing requirements see § 97.303 (Paragraph)

* * * * * * *				
HF	MHz	MHz	MHz	
* * * * * * *				
60 m.	5.3515-5.3665	5.3515-5.3665	5.3515-5.3665	(h)
* * * * * * *				

20. Amend § 97.303 by revising paragraph (h) to read as follows:

§ 97.303 Frequency sharing requirements.

* * * * *

(h) Amateur stations transmitting on frequencies in the 60 m band must not cause harmful interference to, and must accept interference from, stations authorized by:

(1) The United States (NTIA and FCC) and other nations in the fixed service; and

(2) Other nations in the mobile except aeronautical mobile service.

(3) In the 5330.5-5406.4 kHz band (60 m band), amateur stations may transmit only in the 5351.5-5366.5 kHz band and on the four center frequencies specified in the table below. For the discrete channels, control operators of stations transmitting phone, data, and RTTY emissions (emission designators 2K80J3E, 2K80J2D, and 60H0J2B, respectively) may set the carrier frequency 1.5 kHz below the center frequency as specified in the table below. For CW emissions (emission designator 150HA1A), the carrier frequency is set to the center frequency. For all 60 m spectrum, Amateur operators shall ensure that their emissions do not occupy more than 2.8 kHz.

60 M Band Frequencies (kHz)	
Carrier	**Center**
5330.5	5332.0
5346.5	5348.0
5371.5	5373.0
5403.5	5405.0

* * * * *

21. Amend § 97.305 by revising the entry for the “60 m” wavelength band in the table in paragraph (c) to read as follows:

§ 97.305 Authorized emission types.

* * * * *

(c) * * *

Wavelength band	Frequencies	Emission types authorized	Standards see § 97.307, paragraph(s):
* * * * * * *			
HF:			

		* * * * * * *	
60 m	5.332, 5.348, 5.3515-5.3665, 5.373, 5.405 MHz	Phone, RTTY, data	(f)(14)
		* * * * * * *	

Wavelength band	Frequencies	Emission types authorized	Standards see § 97.307(f), paragraph:
		* * * * * * *	
HF:			
		* * * * * * *	
60 m	5.3515-5.3665 MHz	Phone, RTTY, data	(14)
		* * * * * * *	

22. Amend § 97.307 by revising paragraph (f)(14) to read as follows:

§ 97.307 Emission standards.

* * * * *

(f) * * *

(14) In the 60 m band:

(i) A station may transmit only phone, RTTY, data, and CW emissions. RTTY or data emissions must meet the digital code specifications listed in § 97.309. Emissions must not exceed a bandwidth of 2.8 kilohertz.

(ii) The control operator of a station transmitting data or RTTY emissions must exercise care to limit the length of transmissions so as not to cause harmful interference to United States Government stations.

23. Amend § 97.313 by revising paragraphs (f) and (i) to read as follows:

§ 97.313 Transmitter power standards.

* * * * *

(f) An Earth station or telecommand station may transmit on the 435-438 MHz segment with a maximum of 611 W effective radiated power (1 kW equivalent isotropically radiated power). The transmitting antenna elevation angle between the lower half-power (−3 dB relative to the peak or antenna bore sight) point and the horizon must always be greater than 10°. No other station may transmit with a transmitter power exceeding 50 W PEP on the UHF 70 cm band from an area specified in § 2.106(c)(270)(i) of this chapter, unless expressly authorized by the FCC after mutual agreement, on a case-by-case basis, between the Regional Director of the applicable field facility and the military area frequency coordinator at the applicable military base.

* * * * *

(i) 60 m band power requirements: No station may transmit on the frequencies 5.332, 5.348, 5.373, and 5.405 MHz in the 60 m band with a radiated power exceeding 100 W ERP. No station may transmit in the 5.3515-5.3665 MHz band with a radiated power exceeding 9.15 W ERP. For the purpose of computing ERP, the transmitter PEP will be multiplied by the antenna gain relative to a half-wave dipole antenna. A half-wave dipole antenna will be presumed to have a gain of 1 (0 dBd). Licensees using other antennas must maintain in their station records either the antenna manufacturer's data on the antenna gain or calculations of the antenna gain.

* * * * *

PART 101—FIXED MICROWAVE SERVICES

24. The authority citation for part 101 continues to read as follows:

Authority: 47 U.S.C. 154, 303.

§§ 101.83, 101.85, 101.89 and 101.91 [Removed and Reserved]

25. Remove and reserve § 101.83, 101.85, 101.89, and 101.91.

26. Amend § 101.95 by revising the section heading and paragraph (a) to read as follows:

§ 101.95 Provisions for grandfathered licensees in the 18.30-19.30 GHz band.

(a) FSS licensees may require the incumbent to cease operations, provided that the FSS licensee turns on a system within interference range of the incumbent, as determined by TIA Bulletin 10-F or any standard successor. FSS licensee notification to the affected FS licensee must be in writing and must provide the incumbent with no less than six months to vacate the spectrum. After the six-month notice period has expired, the FS licensee must relinquish its license to the Commission, unless it has entered into an agreement with the affected FSS licensee that allows it to continue to operate on a mutually agreed upon basis.

* * * * *

§ 101.97 [Removed and Reserved]

27. Remove and reserve § 101.97.

28. Amend § 101.147 by revising the list of frequency bands in paragraph (a), removing note 30 of paragraph (a), revising the introductory text of paragraph (r), removing and reserving paragraph (r)(4), and revising paragraphs (r)(7), (8), (10), (12), and (13) to read as follows:

§ 101.147 Frequency assignments.

(a) * * *

928.0–929.0 MHz (28)
932.0–932.5 MHz (27)
932.5–935 MHz (17)
941.0–941.5 MHz (27)

941.5–944 MHz (17) (18)
952.0–960.0 MHz (28)
1,850–1,990 MHz (20) (22)
2,110–2,130 MHz (1) (3) (7) (20) (23)
2,130–2,150 MHz (20) (22)
2,160–2,180 MHz (1) (2) (20) (23)
2,180–2,200 MHz (20) (22)
2,450–2,500 MHz (12)
2,650–2,690 MHz
3,700–4,200 MHz (8) (14) (25)
5,925–6,425 MHz (6) (14) (25)
6,425–6,525 MHz (24)
6,525–6.875 MHz (14) (33)
6,875–7,125 MHz (10), (34)
10,550–10,680 MHz (19)
10,700–11,700 MHz (8) (9) (19) (25)
11,700–12,200 MHz (24)
12,200–12,700 MHz (31)
12,700–13,200 (22), (34)
13,200–13,250 MHz (4) (24) (25)
14,200-14,400 MHz (24)
17,700-18,300 MHz (5) (10) (15)
19,300-19,700 MHz (5) (10) (15)
21,200–22,000 MHz (4) (11) (12) (13) (24) (25) (26)
22,000–23,600 MHz (4) (11) (12) (24) (25) (26)
24,250–25,250 MHz
29,100–29,250 MHz (5), (16)
31,000–31,300 MHz (16)
42,000–42,500 MHz
71,000–76,000 MHz (5) (17)
81,000–86,000 MHz (5) (17)
92,000–94,000 MHz (17)
94,100–95,000 MHz (17)

* * * * *

(r) In the bands 17,700 to 19,700 and 24,250 to 25,250 MHz: Operation of stations using frequencies in these bands is permitted to the extent specified in this paragraph (r). Licensees, except 24 GHz band licensees, may use either a two-way link or one frequency of a frequency pair for a one-way link and must coordinate proposed operations pursuant to the procedures required in § 101.103. The use of the band 18.3-19.3 GHz is limited to grandfathered stations. Licensees in the fixed-satellite service may require that licensees of grandfathered stations operating in the bands 18.3-19.3 GHz cease operations in accordance with the provisions in § 101.95. (Note that stations authorized as of September 9, 1983, to use frequencies in the band 17.7-19.7 GHz may, upon proper application, continue to be authorized for such operations, consistent with the above conditions in this paragraph (r) related to the 18.3-19.3 GHz band.) Applicants for one-way spectrum from 17.7-18.3 GHz for multichannel video programming distribution are governed by paragraph (r)(6) of this section. Licensees are also allowed to use one-way (unpaired) channels in the 17.7-17.74 GHz sub-band to pair with other channels in the FS portions of the 18 GHz band where, for example, the return pair is already in use and therefore blocked or in TDD systems. Stations used for MVPD operations in the 17.7-17.8 GHz band must coordinate with the Federal Government before operating in the zones specified in § 1.924(e) of this chapter.

* * * * *

(7) 10 Megahertz maximum authorized bandwidth channels:

Table 7 to paragraph (r)(7)

Transmit (receive) (MHz)	Receive (transmit) (MHz)
1560 Megahertz Separation	
17705.0	N/A
17715.0	N/A
17725.0	N/A
17735.0	N/A
17745.0	19305.0
17755.0	19315.0
17765.0	19325.0
17775.0	19335.0
17785.0	19345.0
17795.0	19355.0
17805.0	19365.0
17815.0	19375.0
17825.0	19385.0
17835.0	19395.0
17845.0	19405.0
17855.0	19415.0
17865.0	19425.0
17875.0	19435.0
17885.0	19445.0
17895.0	19455.0
17905.0	19465.0
17915.0	19475.0
17925.0	19485.0
17935.0	19495.0
17945.0	19505.0
17955.0	19515.0
17965.0	19525.0
17975.0	19535.0
17985.0	19545.0
17995.0	19555.0
18005.0	19565.0
18015.0	19575.0
18025.0	19585.0
18035.0	19595.0
18045.0	19605.0
18055.0	19615.0
18065.0	19625.0

18075.0	19635.0
18085.0	19645.0
18095.0	19655.0
18105.0	19665.0
18115.0	19675.0
18125.0	19685.0
18135.0	19695.0

(8) 20 Megahertz maximum authorized bandwidth channels:

Table 8 to paragraph (r)(8)

Transmit (receive) (MHz)	Receive (transmit) (MHz)
1560 Megahertz Separation	
17710.0	N/A
17730.0	N/A
17750.0	19310.0
17770.0	19330.0
17790.0	19350.0
17810.0	19370.0
17830.0	19390.0
17850.0	19410.0
17870.0	19430.0
17890.0	19450.0
17910.0	19470.0
17930.0	19490.0
17950.0	19510.0
17970.0	19530.0
17990.0	19550.0
18010.0	19570.0
18030.0	19590.0
18050.0	19610.0
18070.0	19630.0
18090.0	19650.0
18110.0	19670.0
18130.0	19690.0

* * * * *

(10) 40 Megahertz maximum authorized bandwidth channels:

Table 10 to paragraph (r)(10)

Transmit (receive) (MHz)	Receive (transmit) (MHz)
1560 Megahertz Separation	
17720.0	N/A

17760.0	19320.0
17800.0	19360.0
17840.0	19400.0
17880.0	19440.0
17920.0	19480.0
17960.0	19520.0
18000.0	19560.0
18040.0	19600.0
18080.0	19640.0
18120.0	19680.0

* * * * *

(12) 80 Megahertz maximum authorized bandwidth channels:

Table 12 to paragraph (r)(12)

Transmit (receive) (MHz)	Receive (transmit) (MHz)
1560 Megahertz Separation	
17740.0	N/A
17820.0	19380.0
17900.0	19460.0
17980.0	19540.0
18060.0	19620.0

(13) The frequencies on channels 35-39 listed in Table 13 are available for point-to-multipoint systems and are available by geographic area licensing in the 24 GHz Service to be used by the relevant licensee. The 24 GHz spectrum can be aggregated or disaggregated and does not have to be used in the transmit/receive manner shown except to comply with international agreements along the U.S. borders. Channels 35 through 39 are licensed in the 24 GHz Service by Economic Areas for any digital fixed service. Channels may be used at either nodal or subscriber station locations for transmit or receive but must be coordinated with adjacent channel and adjacent area users in accordance with the provisions of § 101.509. Stations also must comply with all applicable international coordination agreements.

Table 13 to paragraph (r)(13)

Channel No.	Nodal station frequency band (MHz) limits	User station frequency band (MHz) limits
35	24,250-24,290	25,050-25,090
36	24,290-24,330	25,090-25,130
37	24,330-24,370	25,130-25,170
38	24,370-24,410	25,170-25,210
39	24,410-24,450	25,210-25,250

* * * * *

APPENDIX B

Final Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *Amendment of the Commission's Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference (Geneva, 2015) (WRC-15), Other Allocation Issues, and Related Rule Updates*, *Notice of Proposed Rulemaking* (*Notice*) released in April 2023.[2] The Commission sought written public comment on the proposals in the *Notice*, including comment on the IRFA.[3] No comments were filed addressing the IRFA. This present Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.[4]

A. Need for, and Objectives of, the Report and Order

2. In the *Report and Order*, the Commission implements spectrum allocation decisions from the *WRC-15 Final Acts*, including those for amateur radio, satellite services, and for aural broadcast auxiliary and television broadcast auxiliary stations. The Commission divides these decisions into space, terrestrial, and other matters. The Commission addresses a multitude of allocation decisions, including those for the space research service, search and rescue systems, Global Flight Tracking, and amateur radio in the 5351.5-5366.5 kHz band, as well as adding and revising several footnotes to the U.S. Table. The Commission also declined to adopt several proposals from the *WRC-15 Notice*, such as declining to provide additional spectrum for EESS operations in the 7190-7250 MHZ band and declining the addition of a new paragraph within section 2.102 to address certain space research service allocations applicable to deep space operations.

3. The Commission addresses satellite issues by providing satellite-based search and rescue systems operating in the 406-406.1 MHz band with protection from out-of-band emissions from operations in the adjacent 100 kilohertz bands at 405.9 and 406.0 MHz and 406.1-406.2 MHz, by adding footnote US265 to the U.S. Table. We also add footnote US78 under § 2.106(c)(78) to the 960-1164 MHz band in the Federal Table and non-Federal Table portions of the U.S. Table to recognize federal use by military systems for Identification Friend or Foe operations on center frequencies 1030 MHz (for interrogators) and 1090 MHz (for transponders). In addition, we allocate the 9.2-9.3 GHz band and the 9.9-10.4 GHz band to the Earth exploration satellite service on a primary basis for Federal use and on a secondary basis for non-federal use.

4. The Commission also revises several footnotes concerning satellite issues including footnotes US13, US224, US128, and US139 as follows:

- Footnote US13 (47 CFR § 2.106(c)(13)) and section 90.265 to prohibit new assignments for the frequencies 406.1250 and 406.1750 MHz, following the effective date of the rules in this proceeding.
- Footnote US224 (47 CFR § 2.106(c)(224)) to require federal systems that utilize spectrum spread techniques for terrestrial communication, navigation, and identification in the 960-1215 MHz band be authorized on the condition that harmful interference not be caused to

[1] 5 U.S.C. § 603. The RFA, 5 U.S.C. §§ 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996, (SBREFA) Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

[2] *Amendment of the Commission's Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference* (Geneva, 2015) (WRC-15), Other Allocation Issues, and Related Rule Updates, Noice of Proposed Rulemaking, ET Docket No. 23-120, Notice of Proposed Rulemaking, 38 FCC Rcd 3528, (2023) (*WRC-15 Notice*).

[3] *See generally Notice*.

[4] 5 U.S.C. § 604.

aeronautical mobile, aeronautical radionavigation, military identification friend or foe operations, aeronautical mobile satellite, and radionavigation satellites.

- Footnote US128 (47 CFR § 2.106(c)(128)) to support the Department of Defense's development of pulsed emissions systems in the 10-10.5 GHz band for the military services.
- Footnote US139 (47 CFR § 2.106(c)(139)) revises the 18.142-19.3 GHz, 28.5-29.1 GHz, and 29.25-29.5 GHz bands and the related service rules because incumbent fixed stations in the 18.3-19.3 GHz band no longer have primary status; raises the secondary non-Federal fixed-satellite service (space-to-Earth) allocation in the 18.142-18.3 GHz band to co-primary status with the fixed service; amends US139 to allow certain fixed stations to continue to operate indefinitely under existing conditions; and revises footnote NG62 to permit grandfathered fixed stations in the 28.5 29.1 GHz and 29.25-29.5 GHz bands to operate on a secondary basis to prioritize fixed-satellite services operating in the band.

5. The Commission addresses terrestrial issues by allocating the 5351.5-5366.5 kHz (60 meter) band to the amateur service on a secondary basis, subject to certain technical and operating requirements. We also update the coordination and contact information in US270 for amateur stations. In addition, we delete the broadcasting service allocation in the 700 MHz band, and delete footnote NG155 as it is unnecessary and inapplicable under our current rules.

6. Lastly, the Commission addresses other matters, which include declining the addition of a new paragraph within section 2.102 to address certain space research service allocations, as well as clarifying amendments to the Commission's rules. The adoption of the rules in the *Report and Order* will harmonize U.S. frequency allocations with the consideration of the decisions made from the World Radiocommunication Conference (Geneva, 2015) (WRC-15) which meet domestic requirements.

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA

7. There were no comments filed that specifically addressed the proposed rules and policies presented in the IRFA.

C. Response to Comments by Chief Counsel for Advocacy of the Small Business Administration

8. Pursuant to the Small Business Jobs Act of 2010, which amended the RFA, the Commission is required to respond to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration (SBA), and to provide a detailed statement of any change made to the proposed rules as a result of those comments.[5] The Chief Counsel did not file any comments in response to the proposed rule(s) in this proceeding.

D. Description and Estimate of the Number of Small Entities To Which the Rules Will Apply

9. The RFA directs agencies to provide a description of, and where feasible, an estimate of the number of small entities that may be affected by the rules adopted herein.[6] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[7] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[8] A "small business

[5] *Id*. § 604 (a)(3).

[6] *Id*. § 604(a)(4).

[7] *Id.* § 601(6).

[8] *Id*. § 601(3) (incorporating by reference the definition of "small-business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public (continued….)

concern" is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.[9]

10. *Small Businesses, Small Organizations, Small Governmental Jurisdictions.* Our actions, over time, may affect small entities that are not easily categorized at present. We therefore describe, at the outset, three broad groups of small entities that could be directly affected herein.[10] First, while there are industry specific size standards for small businesses that are used in the regulatory flexibility analysis, according to data from the Small Business Administration's (SBA) Office of Advocacy, in general a small business is an independent business having fewer than 500 employees.[11] These types of small businesses represent 99.9% of all businesses in the United States, which translates to 33.2 million businesses.[12]

11. Next, the type of small entity described as a "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[13] The Internal Revenue Service (IRS) uses a revenue benchmark of $50,000 or less to delineate its annual electronic filing requirements for small exempt organizations.[14] Nationwide, for tax year 2022, there were approximately 530,109 small exempt organizations in the U.S. reporting revenues of $50,000 or less according to the registration and tax data for exempt organizations available from the IRS.[15]

12. Finally, the small entity described as a "small governmental jurisdiction" is defined generally as "governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand."[16] U.S. Census Bureau data from the 2022 Census of Governments[17] indicate there were 90,837 local governmental jurisdictions consisting of general

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comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

[9] 15 U.S.C. § 632.

[10] 5 U.S.C. § 601(3)-(6).

[11] *See* SBA, Office of Advocacy, "What's New With Small Business?," https://advocacy.sba.gov/wp-content/uploads/2023/03/Whats-New-Infographic-March-2023-508c.pdf (Mar. 2023).

[12] *Id*.

[13] 5 U.S.C. § 601(4).

[14] The IRS benchmark is similar to the population of less than 50,000 benchmark in 5 U.S.C § 601(5) that is used to define a small governmental jurisdiction. Therefore, the IRS benchmark has been used to estimate the number of small organizations in this small entity description. S*ee* Annual Electronic Filing Requirement for Small Exempt Organizations – Form 990-N (e-Postcard), "Who must file," https://www.irs.gov/charities-non-profits/annual-electronic-filing-requirement-for-small-exempt-organizations-form-990-n-e-postcard. We note that the IRS data does not provide information on whether a small exempt organization is independently owned and operated or dominant in its field.

[15] *See* Exempt Organizations Business Master File Extract (EO BMF), "CSV Files by Region," https://www.irs.gov/charities-non-profits/exempt-organizations-business-master-file-extract-eo-bmf. The IRS Exempt Organization Business Master File (EO BMF) Extract provides information on all registered tax-exempt/non-profit organizations. The data utilized for purposes of this description was extracted from the IRS EO BMF data for businesses for the tax year 2022 with revenue less than or equal to $50,000 for Region 1-Northeast Area (71,897), Region 2-Mid-Atlantic and Great Lakes Areas (197,296), and Region 3-Gulf Coast and Pacific Coast Areas (260,447) that includes the continental U.S., Alaska, and Hawaii. This data includes information for Puerto Rico (469).

[16] 5 U.S.C. § 601(5).

[17] 13 U.S.C. § 161. The Census of Governments survey is conducted every five (5) years compiling data for years ending with "2" and "7". *See also* Census of Governments, https://www.census.gov/programs-surveys/economic-census/year/2022/about.html.

purpose governments and special purpose governments in the United States.[18] Of this number, there were 36,845 general purpose governments (county,[19] municipal, and town or township[20]) with populations of less than 50,000 and 11,879 special purpose governments (independent school districts[21]) with enrollment populations of less than 50,000.[22] Accordingly, based on the 2022 U.S. Census of Governments data, we estimate that at least 48,724 entities fall into the category of "small governmental jurisdictions."[23]

13. *Fixed Microwave Services.* Fixed microwave services include common carrier,[24] private-operational fixed,[25] and broadcast auxiliary radio services.[26] They also include the Upper Microwave Flexible Use Service (UMFUS),[27] Millimeter Wave Service (70/80/90 GHz),[28] Local Multipoint Distribution Service (LMDS),[29] the Digital Electronic Message Service (DEMS),[30] 24 GHz Service,[31]

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[18] *See* U.S. Census Bureau, 2022 Census of Governments – Organization Table 2. Local Governments by Type and State: 2022 [CG2200ORG02], https://www.census.gov/data/tables/2022/econ/gus/2022-governments.html. Local governmental jurisdictions are made up of general purpose governments (county, municipal and town or township) and special purpose governments (special districts and independent school districts). *See also* tbl.2. CG2200ORG02 Table Notes Local Governments by Type and State_2022.

[19] *See id.* at tbl.5. County Governments by Population-Size Group and State: 2022 [CG2200ORG05], https://www.census.gov/data/tables/2022/econ/gus/2022-governments.html. There were 2,097 county governments with populations less than 50,000. This category does not include subcounty (municipal and township) governments.

[20] *See id.* at tbl.6. Subcounty General-Purpose Governments by Population-Size Group and State: 2022 [CG2200ORG06], https://www.census.gov/data/tables/2022/econ/gus/2022-governments.html. There were 18,693 municipal and 16,055 town and township governments with populations less than 50,000.

[21] *See id.* at tbl.10. Elementary and Secondary School Systems by Enrollment-Size Group and State: 2022 [CG2200ORG10], https://www.census.gov/data/tables/2022/econ/gus/2022-governments.html. There were 11,879 independent school districts with enrollment populations less than 50,000. *See also* tbl.4. Special-Purpose Local Governments by State Census Years 1942 to 2022 [CG2200ORG04], CG2200ORG04 Table Notes Special Purpose Local Governments by State Census Years 1942 to 2022.

[22] While the special purpose governments category also includes local special district governments, the 2022 Census of Governments data does not provide data aggregated based on population size for the special purpose governments category. Therefore, only data from independent school districts is included in the special purpose governments category.

[23] This total is derived from the sum of the number of general purpose governments (county, municipal and town or township) with populations of less than 50,000 (36,845) and the number of special purpose governments - independent school districts with enrollment populations of less than 50,000 (11,879), from the 2022 Census of Governments - Organizations tbls. 5, 6 & 10.

[24] *See* 47 CFR Part 101, Subparts C and I.

[25] *See id*. Subparts C and H.

[26] Auxiliary Microwave Service is governed by Part 74 of Title 47 of the Commission's Rules. *See* 47 CFR Part 74. Available to licensees of broadcast stations and to broadcast and cable network entities, broadcast auxiliary microwave stations are used for relaying broadcast television signals from the studio to the transmitter, or between two points such as a main studio and an auxiliary studio. The service also includes mobile TV pickups, which relay signals from a remote location back to the studio.

[27] *See* 47 CFR Part 30.

[28] *See* 47 CFR Part 101, Subpart Q.

[29] *See id*. Subpart L.

[30] *See id*. Subpart G.

[31] *See id*.

Multiple Address Systems (MAS),[32] and Multichannel Video Distribution and Data Service (MVDDS),[33] where in some bands licensees can choose between common carrier and non-common carrier status.[34] Wireless Telecommunications Carriers (*except* Satellite)[35] is the closest industry with a SBA small business size standard applicable to these services. The SBA small size standard for this industry classifies a business as small if it has 1,500 or fewer employees.[36] U.S. Census Bureau data for 2017 show that there were 2,893 firms that operated in this industry for the entire year.[37] Of this number, 2,837 firms employed fewer than 250 employees.[38] Thus under the SBA size standard, the Commission estimates that a majority of fixed microwave service licensees can be considered small.

14. The Commission's small business size standards with respect to fixed microwave services involve eligibility for bidding credits and installment payments in the auction of licenses for the various frequency bands included in fixed microwave services. When bidding credits are adopted for the auction of licenses in fixed microwave services frequency bands, such credits may be available to several types of small businesses based average gross revenues (small, very small and entrepreneur) pursuant to the competitive bidding rules adopted in conjunction with the requirements for the auction and/or as identified in Part 101 of the Commission's rules for the specific fixed microwave services frequency bands.[39]

15. In frequency bands where licenses were subject to auction, the Commission notes that as a general matter, the number of winning bidders that qualify as small businesses at the close of an auction does not necessarily represent the number of small businesses currently in service. Further, the Commission does not generally track subsequent business size unless, in the context of assignments or transfers, unjust enrichment issues are implicated. Additionally, since the Commission does not collect data on the number of employees for licensees providing these services, at this time we are not able to estimate the number of licensees with active licenses that would qualify as small under the SBA's small business size standard.

16. *Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing*. This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment.[40] Examples of products made by these establishments are: transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment.[41] The SBA small business size standard for this industry classifies businesses

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[32] *See id.* Subpart O.

[33] *See id*. Subpart P.

[34] *See* 47 CFR §§ 101.533, 101.1017.

[35] *See* U.S. Census Bureau, *2017 NAICS Definition, "517312 Wireless Telecommunications Carriers* (*except Satellite*)," https://www.census.gov/naics/?input=517312&year=2017&details=517312.

[36] *See* 13 CFR § 121.201, NAICS Code 517312 (as of 10/1/22, NAICS Code 517112).

[37] *See* U.S. Census Bureau, *2017 Economic Census of the United States*, *Employment Size of Firms for the U.S.: 2017,* Table ID: EC1700SIZEEMPFIRM, NAICS Code 517312, https://data.census.gov/cedsci/table?y=2017&n=517312&tid=ECNSIZE2017.EC1700SIZEEMPFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[38] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

[39] *See* 47 CFR §§ 101.538(a)(1)-(3), 101.1112(b)-(d), 101.1319(a)(1)-(2), and 101.1429(a)(1)-(3).

[40] *See* U.S. Census Bureau, *2017 NAICS Definition, "334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing,*" https://www.census.gov/naics/?input=334220&year=2017&details=334220.

[41] *Id*.

having 1,250 employees or less as small.[42] U.S. Census Bureau data for 2017 show that there were 656 firms in this industry that operated for the entire year.[43] Of this number, 624 firms had fewer than 250 employees.[44] Thus, under the SBA size standard, the majority of firms in this industry can be considered small.

17. *Public Safety Radio Licensees*. As a general matter, Public Safety Radio Pool licensees include police, fire, local government, forestry conservation, highway maintenance, and emergency medical services.45 Because of the vast array of public safety licensees, the Commission has not developed a small business size standard specifically applicable to public safety licensees. Wireless Telecommunications Carriers (except Satellite)46 is the closest industry with a SBA small business size standard applicable to these services. The SBA small business size standard for this industry classifies a business as small if it has 1,500 or fewer employees.47 U.S. Census Bureau data for 2017 show that there were 2,893 firms that operated in this industry for the entire year.48 Of this number, 2,837 firms employed fewer than 250 employees.49 Thus under the SBA size standard, the Commission estimates that a majority of licensees in this industry can be considered small.

18. With respect to local governments, in particular, since many governmental entities comprise the licensees for these services, we include under public safety services the number of government entities affected. According to Commission records as of December 2021, there were approximately 127,019 active licenses within these services.[50] Included in this number were 3,577 active

[42] *See* 13 CFR § 121.201, NAICS Code 334220.

[43] *See* U.S. Census Bureau, *2017 Economic Census of the United States*, *Employment Size of Firms for the U.S.: 2017,* Table ID: EC1700SIZEEMPFIRM, NAICS Code 334220, https://data.census.gov/cedsci/table?y=2017&n=334220&tid=ECNSIZE2017.EC1700SIZEEMPFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[44] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

[45] *See* subparts A and B of Part 90 of the Commission's Rules, 47 CFR §§ 90.1-90.22. Police licensees serve state, county, and municipal enforcement through telephony (voice), telegraphy (code), and teletype and facsimile (printed material). Fire licensees are comprised of private volunteer or professional fire companies, as well as units under governmental control. Public Safety Radio Pool licensees also include state, county, or municipal entities that use radio for official purposes. State departments of conservation and private forest organizations comprise forestry service licensees that set up communications networks among fire lookout towers and ground crews. State and local governments are highway maintenance licensees that provide emergency and routine communications to aid other public safety services to keep main roads safe for vehicular traffic. Emergency medical licensees use these channels for emergency medical service communications related to the delivery of emergency medical treatment. Additional licensees include medical services, rescue organizations, veterinarians, persons with disabilities, disaster relief organizations, school buses, beach patrols, establishments in isolated areas, communications standby facilities, and emergency repair of public communications facilities.

[46] *See* U.S. Census Bureau, *2017 NAICS Definition, "517312 Wireless Telecommunications Carriers* (*except Satellite*)," https://www.census.gov/naics/?input=517312&year=2017&details=517312.

[47] *See* 13 CFR § 121.201, NAICS Code 517312 (as of 10/1/22, NAICS Code 517112).

[48] *See* U.S. Census Bureau, *2017 Economic Census of the United States*, *Employment Size of Firms for the U.S.: 2017,* Table ID: EC1700SIZEEMPFIRM, NAICS Code 517312, https://data.census.gov/cedsci/table?y=2017&n=517312&tid=ECNSIZE2017.EC1700SIZEEMPFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[49] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

[50] Based on a FCC Universal Licensing System search on December 13, 2021. https://wireless2.fcc.gov/UlsApp/UlsSearch/searchAdvanced.jsp. Search parameters: Service Group = All, "Match only the following radio service(s)", Radio Service = GE, GF, GP, PA, PW, YE, YF, YP, YW; Authorization Type (continued….)

licenses in the Public Safety 4.9 GHz band.[51] Since the Commission does not collect data on the number of employees for licensees providing these services, at this time we are therefore not able to estimate the number of licensees with active licenses that would qualify as small under the SBA's small business size standard.

19. *Other Communications Equipment Manufacturing.* This industry comprises establishments primarily engaged in manufacturing communications equipment (except telephone apparatus, and radio and television broadcast, and wireless communications equipment).[52] Examples of such manufacturing include fire detection and alarm systems manufacturing, Intercom systems and equipment manufacturing, and signals (e.g., highway, pedestrian, railway, traffic) manufacturing.[53] The SBA small business size standard for this industry classifies firms having 750 or fewer employees as small.[54] U.S. Census Bureau data for 2017 show that 321 firms in this industry operated for the entire year.[55] Of this number, 310 firms operated with fewer than 250 employees.[56] Based on this data, we conclude that the majority of firms in this industry are small.

20. *Wireless Telecommunications Carriers (except Satellite).* This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves.[57] Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular services, paging services, wireless Internet access, and wireless video services.[58] The SBA size standard for this industry classifies a business as small if it has 1,500 or fewer employees.[59] U.S. Census Bureau data for 2017 show that there were 2,893 firms in this industry that operated for the entire year.[60] Of that number, 2,837 firms employed fewer than 250 employees.[61] Additionally, based on Commission data in the 2022 Universal Service Monitoring Report,

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= All; Status = Active. We note that the number of active licenses does not equate to the number of licensees. A licensee can have one or more licenses.

[51] *Id.* https://wireless2.fcc.gov/UlsApp/UlsSearch/searchAdvanced.jsp. Search parameters: Service Group = All, "Match only the following radio service(s)", Radio Service = PA; Authorization Type = All; Status = Active. We note that the number of active licenses does not equate to the number of licensees. A licensee can have one or more licenses.

[52] *See* U.S. Census Bureau, *2017 NAICS Definition, "334290 Other Communications Equipment Manufacturing,"* https://www.census.gov/naics/?input=334290&year=2017&details=334290.

[53] Id.

[54] *See* 13 CFR 121.201, NAICS Code 334290.

[55] *See* U.S. Census Bureau, *2017 Economic Census of the United States*, *Selected Sectors: Employment Size of Firms for the U.S.: 2017,* Table ID: EC1700SIZEEMPFIRM, NAICS Code 334290, https://data.census.gov/cedsci/table?y=2017&n=334290&tid=ECNSIZE2017.EC1700SIZEEMPFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[56] *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

[57] *See* U.S. Census Bureau, *2017 NAICS Definition, "517312 Wireless Telecommunications Carriers (except Satellite),"* https://www.census.gov/naics/?input=517312&year=2017&details=517312.

[58] Id.

[59] *See* 13 CFR § 121.201, NAICS Code 517312 (as of 10/1/22, NAICS Code 517112).

[60] *See* U.S. Census Bureau, *2017 Economic Census of the United States*, *Employment Size of Firms for the U.S.: 2017,* Table ID: EC1700SIZEEMPFIRM, NAICS Code 517312, https://data.census.gov/cedsci/table?y=2017&n=517312&tid=ECNSIZE2017.EC1700SIZEEMPFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[61] *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

as of December 31, 2021, there were 594 providers that reported they were engaged in the provision of wireless services.[62] Of these providers, the Commission estimates that 511 providers have 1,500 or fewer employees.[63] Consequently, using the SBA's small business size standard, most of these providers can be considered small entities.

21. *Satellite Telecommunications.* This industry comprises firms "primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications."[64] Satellite telecommunications service providers include satellite and earth station operators. The SBA small business size standard for this industry classifies a business with $44 million or less in annual receipts as small.[65] U.S. Census Bureau data for 2017 show that 275 firms in this industry operated for the entire year.[66] Of this number, 242 firms had revenue of less than $25 million.[67] Additionally, based on Commission data in the 2022 Universal Service Monitoring Report, as of December 31, 2021, there were 65 providers that reported they were engaged in the provision of satellite telecommunications services.[68] Of these providers, the Commission estimates that approximately 42 providers have 1,500 or fewer employees.[69] Consequently, using the SBA's small business size standard, a little more than half of these providers can be considered small entities.

22. *Auxiliary, Special Broadcast and Other Program Distribution Services*. This service involves a variety of transmitters, generally used to relay broadcast programming to the public (through translator and booster stations) or within the program distribution chain (from a remote news gathering unit back to the station). Neither the SBA nor the Commission have developed a small business size standard applicable to broadcast auxiliary licensees. The closest applicable industries with a SBA small business size standard fall within two industries - Radio Stations[70] and Television Broadcasting.[71] The SBA small business size standard for Radio Stations classifies firms having $47 million or less in annual receipts as small.[72] U.S. Census Bureau data for 2017 show that 2,963 firms operated in this industry

[62] Federal-State Joint Board on Universal Service, Universal Service Monitoring Report at 26, Table 1.12 (2022), https://docs.fcc.gov/public/attachments/DOC-391070A1.pdf.

[63] *Id*.

[64] *See* U.S. Census Bureau, *2017 NAICS Definition, "517410 Satellite Telecommunications,"* https://www.census.gov/naics/?input=517410&year=2017&details=517410.

[65] *See* 13 CFR § 121.201, NAICS Code 517410.

[66] *See* U.S. Census Bureau, 2017 Economic Census of the United States, Selected Sectors: Sales, Value of Shipments, or Revenue Size of Firms for the U.S.: 2017, Table ID: EC1700SIZEREVFIRM, NAICS Code 517410, https://data.census.gov/cedsci/table?y=2017&n=517410&tid=ECNSIZE2017.EC1700SIZEREVFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[67] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard. We also note that according to the U.S. Census Bureau glossary, the terms receipts and revenues are used interchangeably, *see* https://www.census.gov/glossary/#term_ReceiptsRevenueServices.

[68] Federal-State Joint Board on Universal Service, Universal Service Monitoring Report at 26, Table 1.12 (2022), https://docs.fcc.gov/public/attachments/DOC-391070A1.pdf.

[69] *Id*.

[70] *See* U.S. Census Bureau, *2017 NAICS Definition, "515112 Radio Stations*," https://www.census.gov/naics/?input=515112&year=2017&details=515112.

[71] *Id. "515120 Television Broadcasting,*" https://www.census.gov/naics/?input=515120&year=2017&details=515120.

[72] *See* 13 CFR § 121.201, NAICS Code 515112 (as of 10/1/22 NAICS Code 516110).

during that year.[73] Of that number, 1,879 firms operated with revenue of less than $25 million per year.[74] For Television Broadcasting, the SBA small business size standard also classifies firms having $47 million or less in annual receipts as small.[75] U.S. Census Bureau data for 2017 show that 744 firms in this industry operated for the entire year.[76] Of that number, 657 firms had revenue of less than $25 million per year.[77] Accordingly, based on the U.S. Census Bureau data for Radio Stations and Television Broadcasting, the Commission estimates that the majority of Auxiliary, Special Broadcast and Other Program Distribution Services firms are small under the SBA size standard.

23. *Fixed Satellite Small Transmit/Receive Earth Stations.* Neither the SBA nor the Commission have developed a small business size standard specifically applicable to Fixed Satellite Small Transmit/Receive Earth Stations. Satellite Telecommunications[78] is the closest industry with an SBA small business size standard. The SBA size standard for this industry classifies a business as small if it has $44 million or less in annual receipts.[79] For this industry, U.S. Census Bureau data for 2017 show that there was a total of 275 firms that operated for the entire year.[80] Of this total, 242 firms had revenue of less than $25 million.[81] Additionally, based on Commission data in the 2022 Universal Service Monitoring Report, as of December 31, 2021, there were 65 providers that reported they were engaged in the provision of satellite telecommunications services.[82] Of these providers, the Commission estimates

[73] See U.S. Census Bureau, 2017 Economic Census of the United States, Selected Sectors: Sales, Value of Shipments, or Revenue Size of Firms for the U.S.: 2017, Table ID: EC1700SIZEREVFIRM, NAICS Code 515112, https://data.census.gov/cedsci/table?y=2017&n=515112&tid=ECNSIZE2017.EC1700SIZEREVFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available. We note that the US Census Bureau withheld publication of the number of firms that operated for the entire year.

[74] *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard. We note that the U.S. Census Bureau withheld publication of the number of firms that operated with sales/value of shipments/revenue in the individual categories for less than $100,000, and $100,000 to $249,999 to avoid disclosing data for individual companies (see Cell Notes for the sales/value of shipments/revenue in these categories). Therefore, the number of firms with revenue that meet the SBA size standard would be higher that noted herein. We also note that according to the U.S. Census Bureau glossary, the terms receipts and revenues are used interchangeably, *see* https://www.census.gov/glossary/#term_ReceiptsRevenueServices.

[75] *See* 13 CFR § 121.201, NAICS Code 515120 (as of 10/1/22 NAICS Code 516120).

[76] See U.S. Census Bureau, 2017 Economic Census of the United States, Selected Sectors: Sales, Value of Shipments, or Revenue Size of Firms for the U.S.: 2017, Table ID: EC1700SIZEREVFIRM, NAICS Code 515120, https://data.census.gov/cedsci/table?y=2017&n=515120&tid=ECNSIZE2017.EC1700SIZEREVFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[77] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard. We also note that according to the U.S. Census Bureau glossary, the terms receipts and revenues are used interchangeably, *see* https://www.census.gov/glossary/#term_ReceiptsRevenueServices.

[78] *See* U.S. Census Bureau, *2017 NAICS Definition, "517410 Satellite Telecommunications,"* https://www.census.gov/naics/?input=517410&year=2017&details=517410.

[79] *See* 13 CFR § 121.201, NAICS Code 517410.

[80] See U.S. Census Bureau, 2017 Economic Census of the United States, Selected Sectors: Sales, Value of Shipments, or Revenue Size of Firms for the U.S.: 2017, Table ID: EC1700SIZEREVFIRM, NAICS Code 517410, https://data.census.gov/cedsci/table?y=2017&n=517410&tid=ECNSIZE2017.EC1700SIZEREVFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[81] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard. We also note that according to the U.S. Census Bureau glossary, the terms receipts and revenues are used interchangeably, *see* https://www.census.gov/glossary/#term_ReceiptsRevenueServices.

[82] Federal-State Joint Board on Universal Service, Universal Service Monitoring Report at 26, Table 1.12 (2022), https://docs.fcc.gov/public/attachments/DOC-391070A1.pdf.

that approximately 42 providers have 1,500 or fewer employees.[83] Consequently, using the SBA's small business size standard, a little more than half of these providers can be considered small entities.

E. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities

24. The rules adopted in the *Report & Order* do not impose new or modified reporting, recordkeeping or other compliance requirements on small and other entities. Nor does the *Report & Order* specifically impose any additional operational or implementation costs. For example, small and other entities that are grandfathered licensees in the 18.30-19.30 GHz band are not required to pay relocation costs. However, fixed-satellite service (FSS) licensees may require the incumbent to cease operations if it intends to turn on a system within interference range of the incumbent. Although the FSS licensee must notify the affected FS licensee in writing and must provide the incumbent with no less than six months to vacate the spectrum. After the six-month notice period has expired, the fixed service licensee must relinquish its license to the Commission, unless it has entered into an agreement with the affected FSS licensee that allows it to continue to operate on a mutually agreed upon basis. While the Commission cannot quantify the cost of compliance for small entities, due to the aforementioned lack of new or modified compliance requirements, the Commission does not believe the adopted rules will impose additional operational or administrative costs or require small entities to hire attorneys, engineers, consultants, or other professionals in order to comply.

F. Steps Taken to Minimize the Significant Economic Impact on Small Entities, and Significant Alternatives Considered

25. The RFA requires an agency to provide, "a description of the steps the agency has taken to minimize the significant economic impact on small entities . . . including a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule considered by the agency which affect the impact on small entities was rejected."[84]

26. The rules adopted by the Commission in the *Report and Order* should benefit small entities by giving them more options to federal and non-federal spectrum while creating little to no harmful interference to licensed incumbents sharing the available bands adopted, and with minimal economic burden. Throughout this rulemaking proceeding, the Commission considered various proposals from small and other entities. The adopted rules reflect the steps the Commission has taken to balance the desire of licensed operators, some of which are small entities, to relocate to other channels without significant economic impact. In addition, the adopted rules decrease the potential for interference, and the need for relocation to other channels has been minimized, thereby reducing costs for small entities that may have limited economic resources.

27. Throughout this proceeding, the Commission considered alternative proposals from various commenters and weighed their benefits against the potential costs to small entities. For example, the Commission considered concerns raised in comments by small and other licensees within the wireless industry regarding the addition of a new paragraph to section 2.102. This additional paragraph, which clarifies that space research systems intended to operate in deep space may also use the space research service (deep space) allocations with the same status as those allocations when the spacecraft is near the Earth and/or flying by or returning to the Earth. CTIA, whose members include small businesses, and T-Mobile both believed that multiple frequency bands, such as the 2110-2120 MHz band, the 7145-7190 MHz band, the 8400-8500 MHz band, and the 12.7-13.25 GHz band, would negatively affect the bands already allocated for wireless services and future advance wireless service (AWS) use. Large carriers such as T-Mobile and Verizon asked the Commission to fully consider how the expansion of the space research (deep space) allocation would impact broader agency and U.S. priorities. T-Mobile conceded

[83] *Id*.

[84] 5 U.S.C. § 604(a)(6).

that an evaluation of this allocation is important, as the proposed near-earth operations include mission critical launch and return to earth functions.

28. The Commission concluded that adopting this proposed addition of a new paragraph to section 2.102 would be both unnecessary and burdensome to small and other licensed operators, as the risk of harmful interference is significant and would create an unnecessary cost to such entities. Many of the entities holding licenses for use of the allocations who qualify as small entities believe the Commission's rules would affect spectrum bands targeted for future wireless use by both the Commission and the NTIA's National Spectrum Strategy. The adopted rules clarify the use of space research service (deep space) allocations. Consequently, we do not expect that the current and future licensees in the band, including small entities, would experience a significant economic impact from permitting terrestrial wireless capacity. As a result, the Commission believes the rules adopted in the *Report and Order* will provide an advantage to small entities, as these entities would benefit from being able to access these spectrums without complication or cost. On balance, this would constitute a significant economic benefit for small entities.

G. Report to Congress

29. The Commission will send a copy of the *Report and Order*, including this FRFA, in a report to Congress pursuant to the Congressional Review Act.[85] In addition, the Commission will send a copy of the *Report and Order*, including this FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of the *Report and Order*, and FRFA (or summaries thereof) will also be published in the Federal Register.[86]

[85] *Id*. § 801(a)(1)(A).

[86] *Id*. § 604(b).